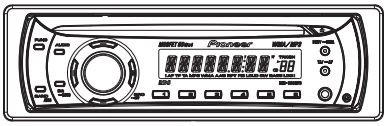
Pioneer

Service Manual



DEH-1100MPB/XN/EW5

ORDER NO.
CRT4230

CD RDS RECEIVER

DEH-1100MPB/XN/EW5
DEH-1100MP/XN/EW5
DEH-1120MP/XN/EW5

This service manual should be used together with the following manual(s):

Model No.	Order No.	Mech.Module	Remarks
CX-3195	CRT3815	S10.5COMP2	CD Mech. Module : Circuit Descriptions, Mech. Descriptions, Disassembly

For details, refer to "Important Check Points for Good Servicing".

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PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
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K-ZZZ. OCT. 2008 Printed in Japan

SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safety repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safety, you should not risk trying to do so and refer the repair to a qualified service technician.

Where in a manufacturer's service documentation, for example in circuit diagrams or lists of components, a symbol is used to indicate that a specific component shall be replaced only by the component specified in that documentation for safety reasons, the following symbol shall be used:

⚠

● **Safety Precautions for those who Service this Unit.**
When checking or adjusting the emitting power of the laser diode exercise caution in order to get safe, reliable results.

Caution:
1. **During repair or tests, minimum distance of 13 cm from the focus lens must be kept.**
2. **During repair or tests, do not view laser beam for 10 seconds or longer.**

CAUTION:
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

CAUTION
CLASS 1M INVISIBLE LASER RADIATION WHEN OPEN. DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS

WARNING!

The AEL (accessible emission level)of the laser power output is less than CLASS 1 but the laser component is capable of emitting radiation exceeding the limit for CLASS 1.
A specially instructed person should do servicing operation of the apparatus.

Laser diode characteristics

Wave length : 785 nm to 814 nm

Maximum output : 1 190 µW(Emitting period : unlimited)

Additional Laser Caution

Transistors Q101 in PCB drive the laser diodes.
When Q101 is shorted between their terminals, the laser diodes will radiate beam.
If the top cover is removed with no disc loaded while such short-circuit is continued, the naked eyes may be exposed to the laser beam.

[Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol.
Please be sure to confirm and follow these procedures.

1. Product safety

Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification(addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris.
Soldering should be finished with the proper quantity. (Refer to the example)

④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs.
In addition, be sure that there are no pinched wires, etc.

⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages.
If you find a damaged power cord, please exchange it with a suitable one.

⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries.
Please pay attention to your surroundings and repair safely.

2. Adjustments

To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification.
Adjustments should be performed in accordance with the procedures/instructions described in this manual.

3. Lubricants, Glues, and Replacement parts

Use grease and adhesives that are equal to the specified substance.
Make sure the proper amount is applied.

4. Cleaning

For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

5. Shipping mode and Shipping screws

To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

CONTENTS

1. SERVICE PRECAUTIONS

1.1 SERVICE PRECAUTIONS

1. You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.
2. Before disassembling the unit, be sure to turn off the power. Unplugging and plugging the connectors during power-on mode may damage the ICs inside the unit.
3. To protect the pickup unit from electrostatic discharge during servicing, take an appropriate treatment (shorting-solder) by referring to "the DISASSEMBLY".
4. After replacing the pickup unit, be sure to check the grating.
5. Be careful in handling ICs. Some ICs such as MOS type are so fragile that they can be damaged by electrostatic induction.

1.2 NOTES ON SOLDERING

- For environmental protection, lead-free solder is used on the printed circuit boards mounted in this unit.
  Be sure to use lead-free solder and a soldering iron that can meet specifications for use with lead-free solders for repairs accompanied by reworking of soldering.

- Compared with conventional eutectic solders, lead-free solders have higher melting points, by approximately 40 °C.
  Therefore, for lead-free soldering, the tip temperature of a soldering iron must be set to around 373 °C in general, although the temperature depends on the heat capacity of the PC board on which reworking is required and the weight of the tip of the soldering iron.

Compared with eutectic solders, lead-free solders have higher bond strengths but slower wetting times and higher melting temperatures (hard to melt/easy to harden).

The following lead-free solders are available as service parts:
- Parts numbers of lead-free solder:
  GYP1006 1.0 in dia.
  GYP1007 0.6 in dia.
  GYP1008 0.3 in dia.

2. SPECIFICATIONS

2.1 SPECIFICATIONS

General

Power source ..... 14.4 V DC (10.8 V to 15.1 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 10.0 A
Backup current ..... 2 mA or less

Dimensions (W × H × D):
- DIN
  - Chassis ..... 178 mm × 50 mm × 162 mm
  - Nose ..... 188 mm × 58 mm × 15 mm
- D
  - Chassis ..... 178 mm × 50 mm × 162 mm
  - Nose ..... 170 mm × 48 mm × 15 mm

Weight ..... 1.3 kg

Audio

Maximum power output ..... 50 W × 4
Continuous power output ... 22 W × 4 (50 Hz to 15 000 Hz, 5% THD, 4 Ω load, both channels driven)
Load impedance ..... 4 Ω (4 Ω to 8 Ω allowable)
Preout max output level ..... 2.0 V
Tone controls:
- Bass
  - Frequency ..... 100 Hz
  - Gain ..... ±13 dB
- Mid
  - Frequency ..... 1 kHz
  - Gain ..... ±12 dB
- Treble
  - Frequency ..... 10 kHz
  - Gain ..... ±12 dB

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal-to-noise ratio ..... 94 dB (1 kHz) (IEC-A network)
Number of channels ..... 2 (stereo)
WMA decoding format ..... Ver. 7, 7.1, 8, 9, 10, 11 (2ch audio)
(Windows Media Player)
MP3 decoding format ..... MPEG-1 & 2 Audio Layer 3
WAV signal format ..... Linear PCM & MS ADPCM

FM tuner

Frequency range ..... 87.5 MHz to 108.0 MHz
Usable sensitivity ..... 11 dBf (0.7 µV/75 Ω , mono, S/N: 30 dB)
Signal-to-noise ratio ..... 72 dB (IEC-A network)

MW tuner

Frequency range ..... 531 kHz to 1 602 kHz
Usable sensitivity ..... 25 µV (S/N: 20 dB)
Signal-to-noise ratio ..... 62 dB (IEC-A network)

LW tuner

Frequency range ..... 153 kHz to 281 kHz
Usable sensitivity ..... 28 µV (S/N: 20 dB)
Signal-to-noise ratio ..... 62 dB (IEC-A network)

Note

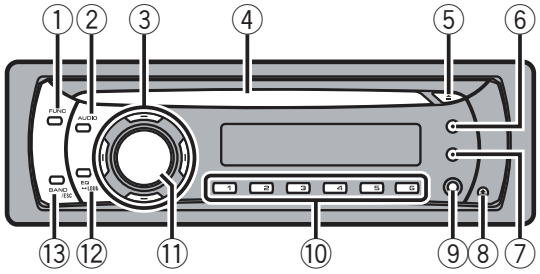
Specifications and the design are subject to modifications without notice due to improvements. ■

2.2 DISC/CONTENT FORMAT

2.3 PANEL FACILITIES

What 's what

Head unit



① **FUNCTION button**
Press to recall the function menu when operating a source.

② **AUDIO button**
Press to select various sound quality controls.

③ **▲/▼/◄/► buttons**
Press to perform manual seek tuning, fast forward, reverse and track search controls.
Also used for controlling functions.

④ **Disc loading slot**
Insert a disc to play.

⑤ **EJECT button**
Press to eject a CD from your built-in CD player.

⑥ **DISPLAY button**
Press to select different displays.
Press and hold to scroll through the text information.

⑦ **TA button**
Press to turn TA function on or off. Press and hold to turn AF function on or off.

⑧ **DETACH button**
Press to remove the front panel from the head unit.

⑨ **AUX input jack (3.5 mm stereo jack)**
Use to connect an auxiliary device.

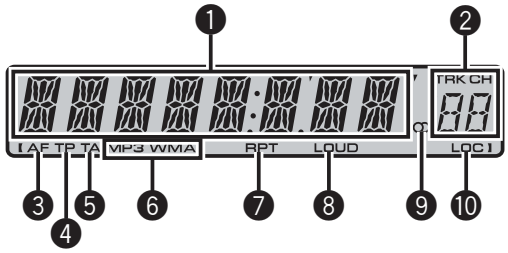
⑩ **1 to 6 buttons**
Press for preset tuning.

⑪ **SOURCE button, VOLUME**
This unit is turned on by selecting a source.
Press to cycle through all the available sources.
Press and hold to recall the initial setting menu when the sources are off.
Rotate it to increase or decrease the volume.

⑫ **EQ button**
Press to select various equalizer curves.
Press and hold to turn loudness on or off.

⑬ **BAND button**
Press to select among MW/LW and two FM bands and cancel the control mode of functions.

Display indication



❶ **Main display section**
Shows the various information such as band, play time, and other setting.
- Tuner
  Band and frequency are displayed.
- RDS
  Program service name, PTY information and other literal information are displayed.
- Built-in CD Player
  Elapsed playback time and literal information are displayed.

❷ **Preset number/track number indicator**
Shows the track number or preset number.

- If a track number 100 or more is selected, ► on the left of the track number indicator will light.

❸ AF indicator
Appears when AF (alternative frequencies search) function is on.

❹ TP indicator
Appears when a TP station is tuned in.

❺ TA indicator
Appears when TA (traffic announcement standby) function is on.

❻ MP3/WMA indicator

❼ RPT indicator
Shows when repeat play is turned on.

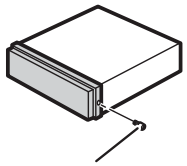
❽ LOUD indicator
Appears when loudness is on.

❾ ⊂⊃ (stereo) indicator
Appears when the selected frequency is being broadcast in stereo.

❿ LOC indicator
Appears when local seek tuning is on.▣

Fastening the front panel

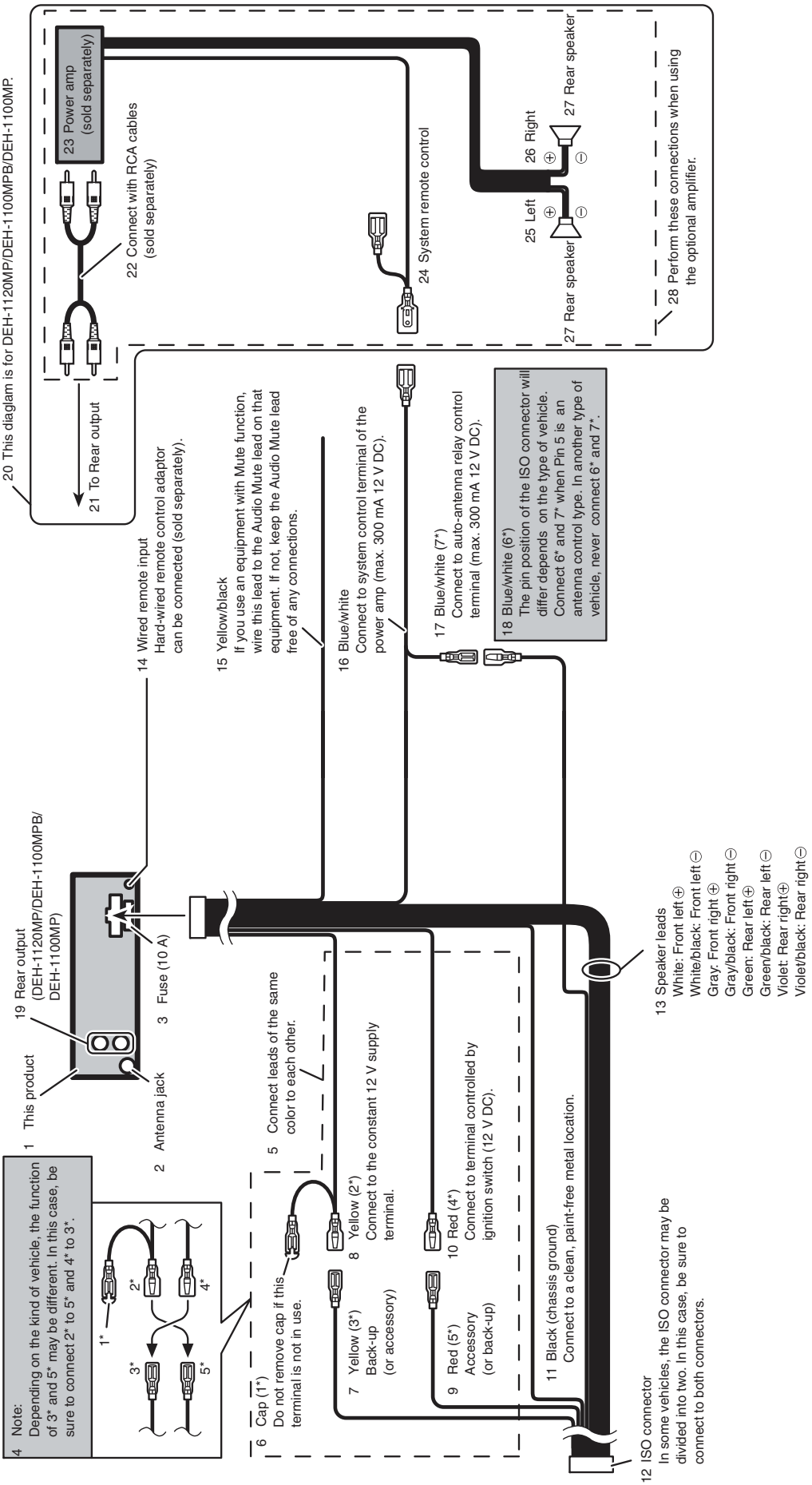
If you do not plan to detach the front panel, the front panel can be fastened with supplied screw.



Screw
BPZ20P080FTC

▣

2.4 CONNECTION DIAGRAM



3. BASIC ITEMS FOR SERVICE

3.1 CHECK POINTS AFTER SERVICING

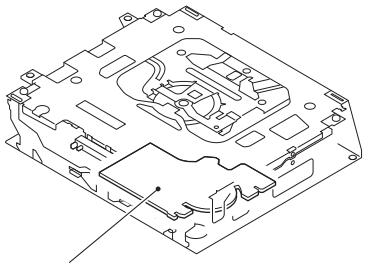
To keep the product quality after servicing, please confirm following check points.

No.		Procedures	Item to be confirmed
1		Confirm whether the customer complain has been solved. If the customer complain occurs with the specific media, use it for the operation check.	The customer complain must not be reappeared. Display, audio and operations must be normal.
2	CD	Play back a CD. (Track search)	No malfunction on display, audio and operation.
3	FM/AM tuner	Check FM/AM tuner action. (Seek, Preset) Switch band to check both FM and AM.	Display, audio and operations must be normal.
4		Check whether no disc is inside the product.	The media used for the operating check must be ejected.
5		Appearance check	No scratches or dirt on its appearance after receiving it for service.

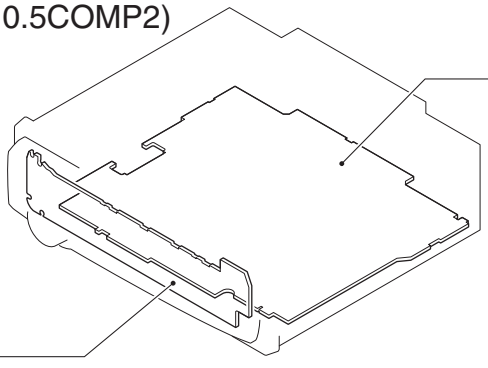
See the table below for the items to be checked regarding audio:

Item to be checked regarding audio
Distortion
Noise
Volume too low
Volume too high
Volume fluctuating
Sound interrupted

3.2 PCB LOCATIONS



C CD Core Unit (S10.5COMP2)



A Tuner Amp Unit

B Keyboard Unit

Unit Number	:	QWM3032	Unit Number	:	(1100MP)
Unit Name	:	Tuner Amp Unit	Unit Number	:	(1100MPB)
Unit Number	:	(1120MP)	Unit Name	:	Keyboard Unit
Unit Name	:	Keyboard Unit	Unit Number	:	CWX3514
			Unit Name	:	CD Core Unit(S10.5COMP2)

3.3 JIGS LIST

● **Jigs List**

Name	Jig No.	Remarks
Test Disc	TCD-782	Checking the grating
L.P.F.		Checking the grating (Two pieces)

● **Grease List**

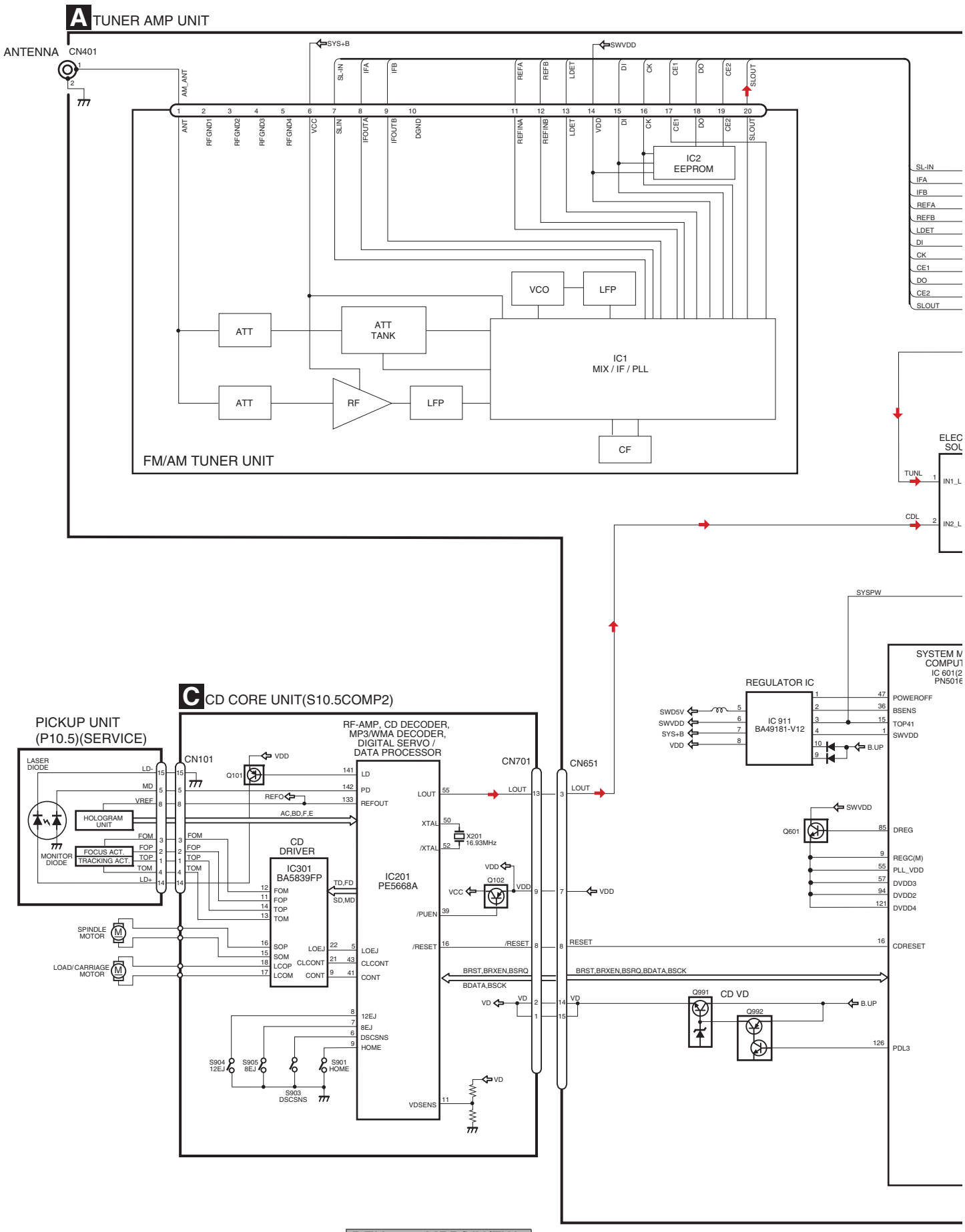
Name	Grease No.	Remarks
Grease	GEM1024	CD Mechanism Module
Grease	GEM1045	CD Mechanism Module

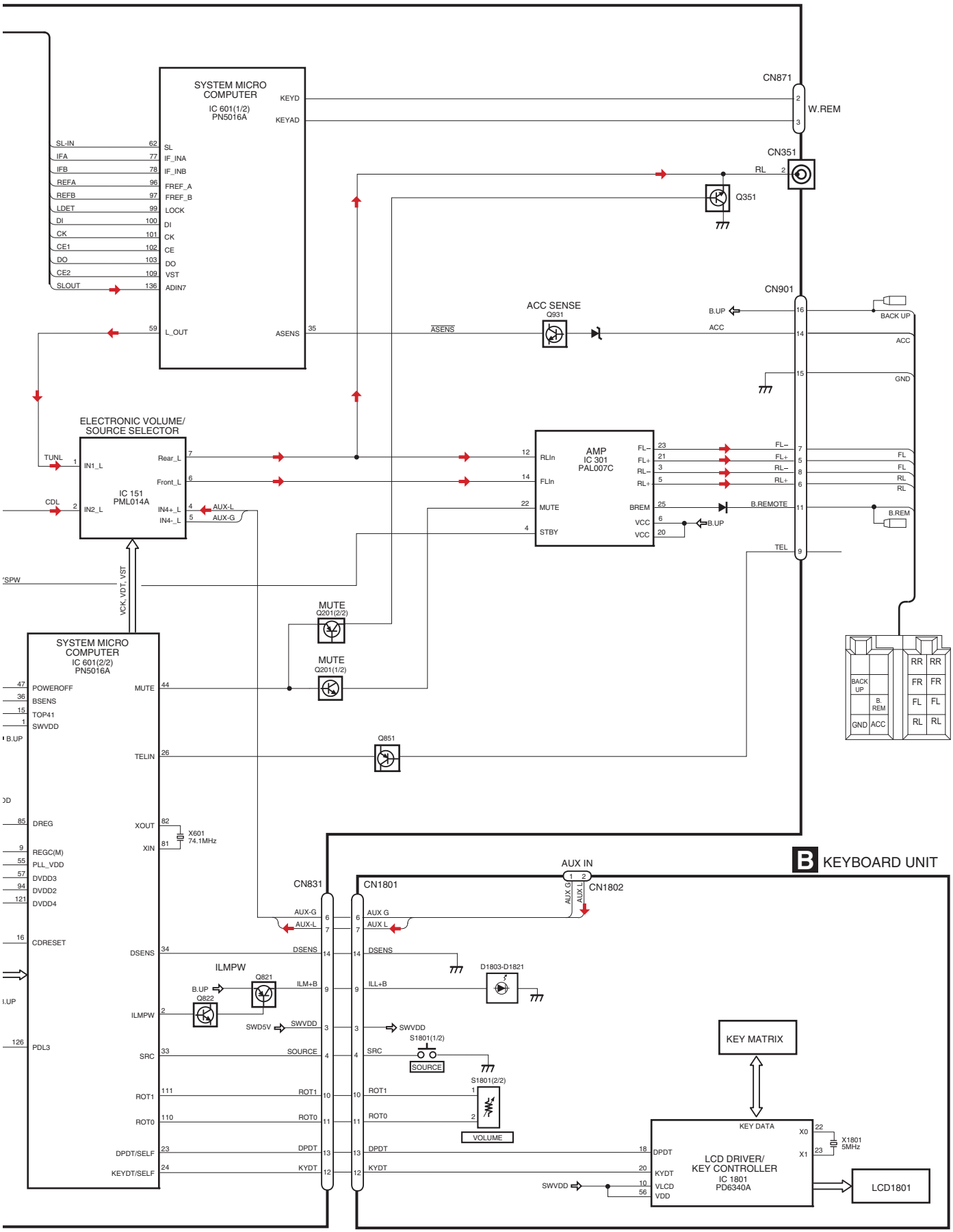
3.4 CLEANING

Before shipping out the product, be sure to clean the following portions by using the prescribed cleaning tools:

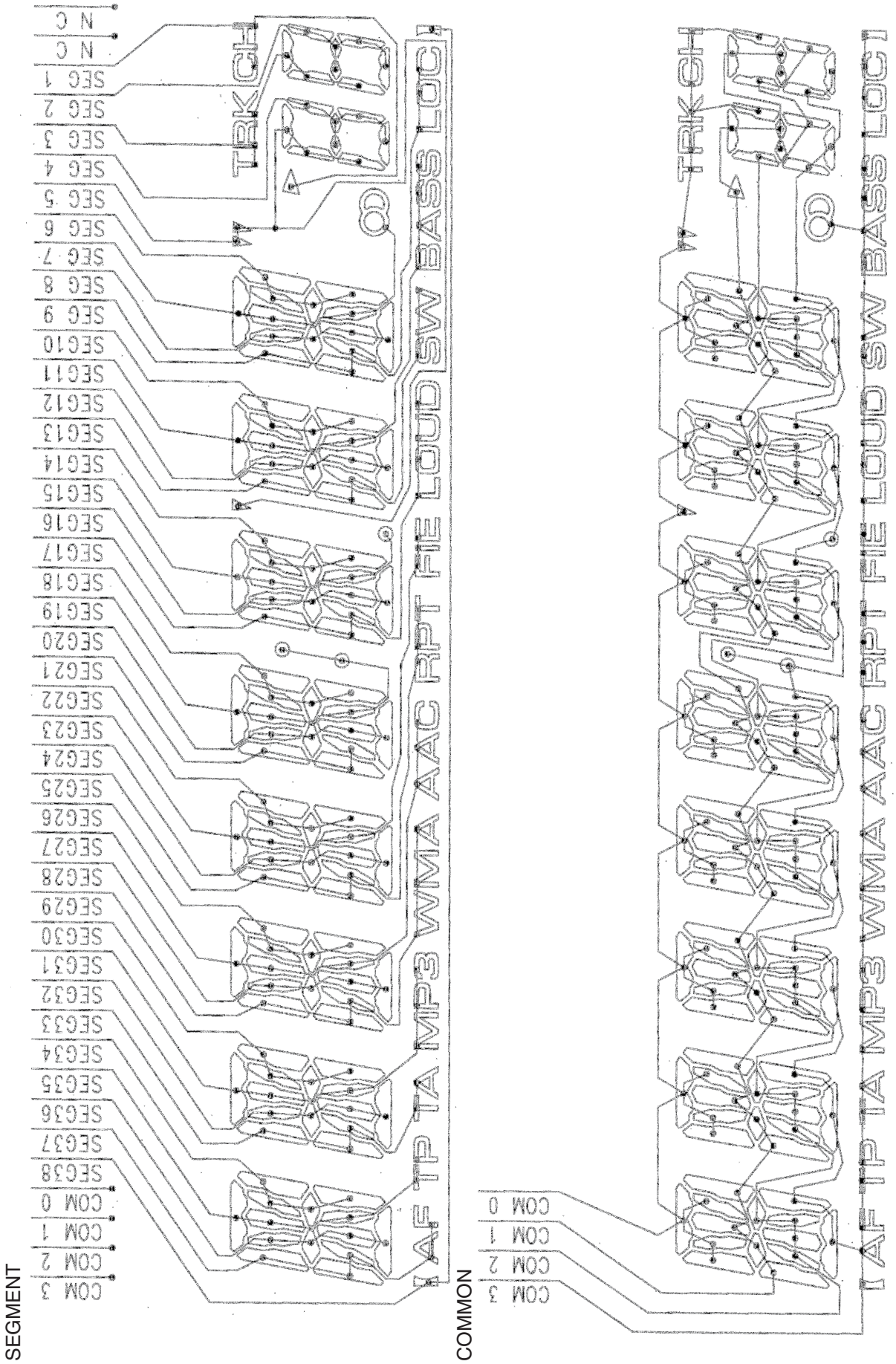
Portions to be cleaned	Cleaning tools
CD pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

4. BLOCK DIAGRAM

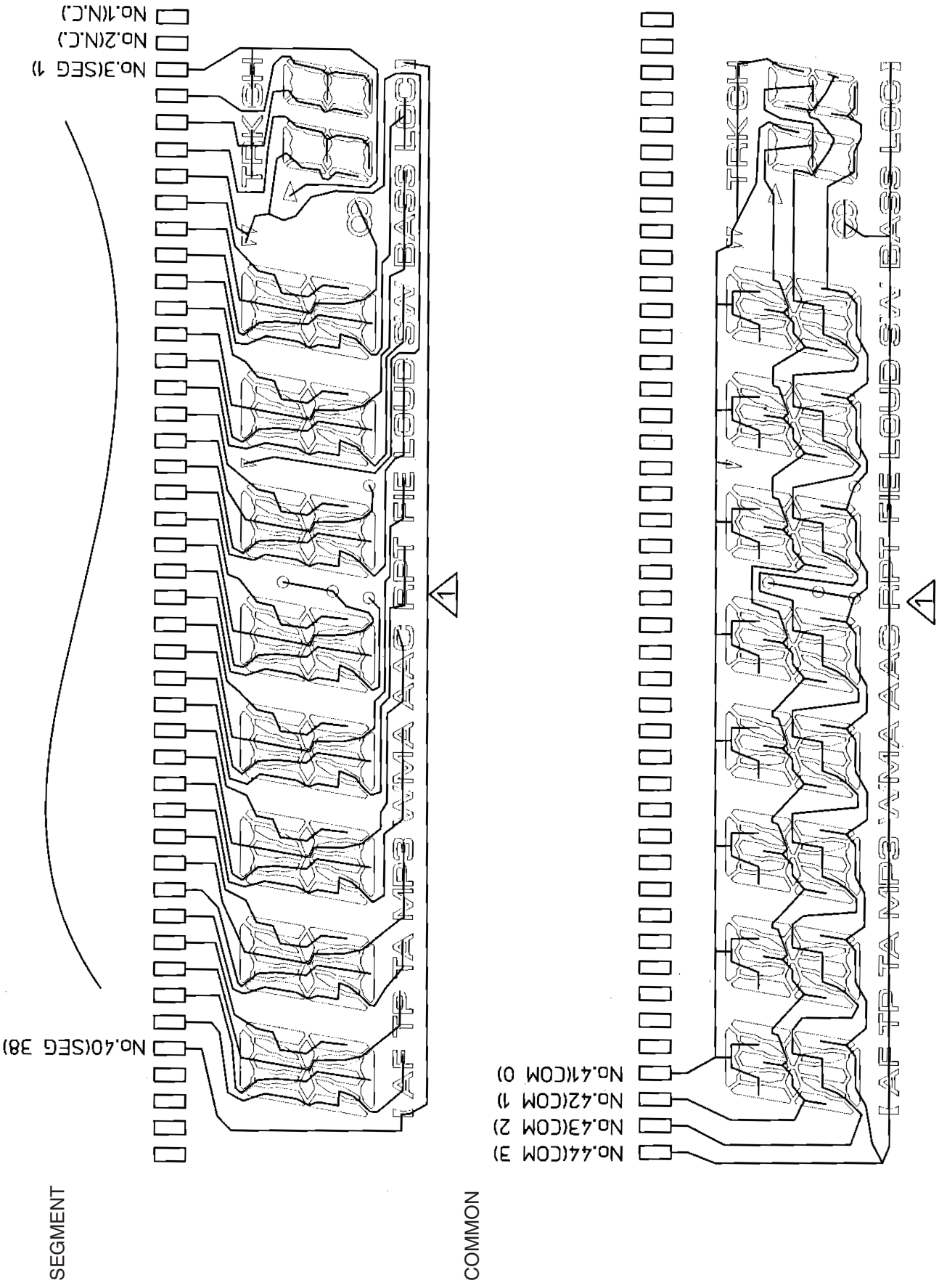



SYSTEM MICRO COMPUTER
IC 601(1/2)
PN5016A
KEYD
KEYAD
SL-IN
IFA
IFB
REFA
REFB
LDET
DI
CK
CE1
DO
CE2
SLOUT
SL
IF_INA
IF_INB
FREF_A
FREF_B
LOCK
DI
CK
CE
DO
VST
ADIN7
L_OUT
ASENS
CN871
W.REM
CN351
RL
Q351
CN901
ACC SENSE
Q931
B.UP
ACC
BACK UP
GND
ELECTRONIC VOLUME/
SOURCE SELECTOR
IC 151
PML014A
TUNL
CDL
IN1_L
IN2_L
Rear_L
Front_L
IN4+_L
IN4-_L
AUX-L
AUX-G
AMP
IC 301
PAL007C
RLIn
FLIn
MUTE
STBY
FL–
FL+
RL–
RL+
BREM
VCC
B.REMOTE
B.REM
TEL
'SPW
VCK, VDT, VST
MUTE
Q201(2/2)
Q201(1/2)
SYSTEM MICRO
COMPUTER
IC 601(2/2)
PN5016A
POWEROFF
BSENS
TOP41
SWVDD
B.UP
MUTE
TELIN
Q851
DREG
XOUT
XIN
X601
74.1MHz
REGC(M)
PLL_VDD
DVDD3
DVDD2
DVDD4
CDRESET
DSENS
ILMPW
Q821
Q822
B.UP
SWD5V
SWVDD
ILM+B
SRC
SOURCE
PDL3
ROT1
ROT0
DPDT/SELF
KEYDT/SELF
DPDT
KYDT
CN831
CN1801
AUX IN
CN1802
AUX G
AUX L
ILL+B
D1803-D1821
S1801(1/2)
SOURCE
S1801(2/2)
VOLUME
KEY MATRIX
KEY DATA
LCD DRIVER/
KEY CONTROLLER
IC 1801
PD6340A
X0
X1
X1801
5MHz
VLCD
VDD
LCD1801
B KEYBOARD UNIT

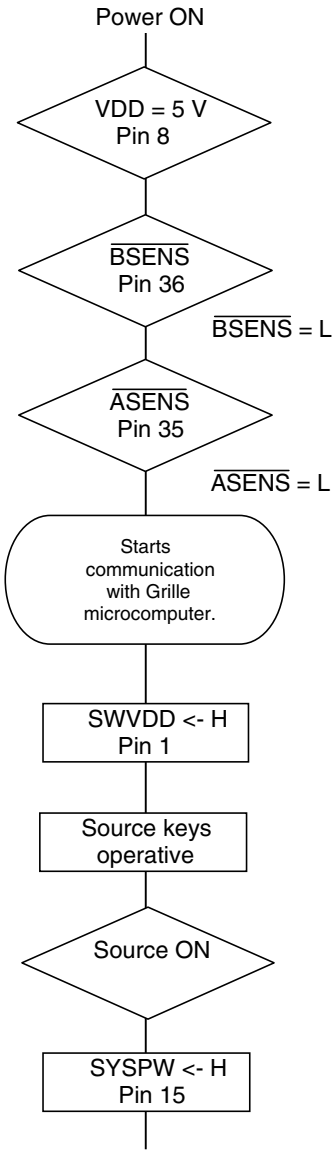
LCD (CAW1927)


SEGMENT
COMMON
TRK 6H
8
1 AF TP TA MP3 WMA AAC RPT FIE LOUD SW BASS LOC

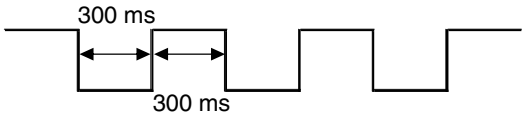
LCD (CAW1932)


No.1(N.C.)
No.2(N.C.)
No.3(SEG 1)
No.40(SEG 38)
SEGMENT
No.41(COM 0)
No.42(COM 1)
No.43(COM 2)
No.44(COM 3)
COMMON

5. DIAGNOSIS
5.1 OPERATIONAL FLOWCHART



Completes power-on operation.
(After that, proceed to each source operation)



In case of the above signal, the communication with Grille microcomputer may fail.
If the time interval is not 300 msec, the oscillator may be defective.

5.2 ERROR CODE LIST

● Error Messages

If a CD is not operative or stopped during operation due to an error, the error mode is turned on and cause(s) of the error is indicated with a corresponding number. This arrangement is intended at reducing nonsense calls from the users and also for facilitating trouble analysis and repair work in servicing.

(1) Basic Indication Method

1) When SERRORM is selected for the CSMOD (CD mode area for the system), error codes are written to DMIN (minutes display area) and DSEC (seconds display area). The same data is written to DMIN and DSEC. DTNO remains in blank as before.

2) Head unit display examples

Depending on display capability of LCD used, display will vary as shown below. xx contains the error number.

8-digit display	6-digit display	4-digit display
ERROR-xx	ERR-xx	E-xx

(2) Error Code List

Code	Class	Displayed error code	Description of the code and potential cause(s)
10	Electricity	Carriage Home NG SERVO LSI Communication Error	CRG can't be moved to inner diameter. CRG can't be moved from inner diameter. -> Failure on home switch or CRG move mechanism. Communication error between microcomputer and SERVO LSI.
11	Electricity	Focus Servo NG	Focusing not available. -> Stains on rear side of disc or excessive vibrations on REWRITABLE.
12	Electricity	Spindle Lock NG Subcode NG	Spindle not locked. Sub-code is strange (not readable). -> Failure on spindle, stains or damages on disc, or excessive vibrations. A disc not containing CD-R data is found. Turned over disc are found, though rarely. CD signal error.
17	Electricity	Setup NG	AGC protection doesn't work. Focus can be easily lost. -> Damages or stains on disc, or excessive vibrations on REWRITABLE.
30	Electricity	Search Time Out	Failed to reach target address. -> CRG tracking error or damages on disc.
44	Electricity	ALL Skip	Skip setting for all track. (CD-R/RW)
50	Mechanism	CD On Mech Error	Mechanical error during CD ON. -> Defective loading motor, mechanical lock and mechanical sensor.
A0	System	Power Supply NG	Power (VD) is ground faulted. -> Failure on SW transistor or power supply (failure on connector).

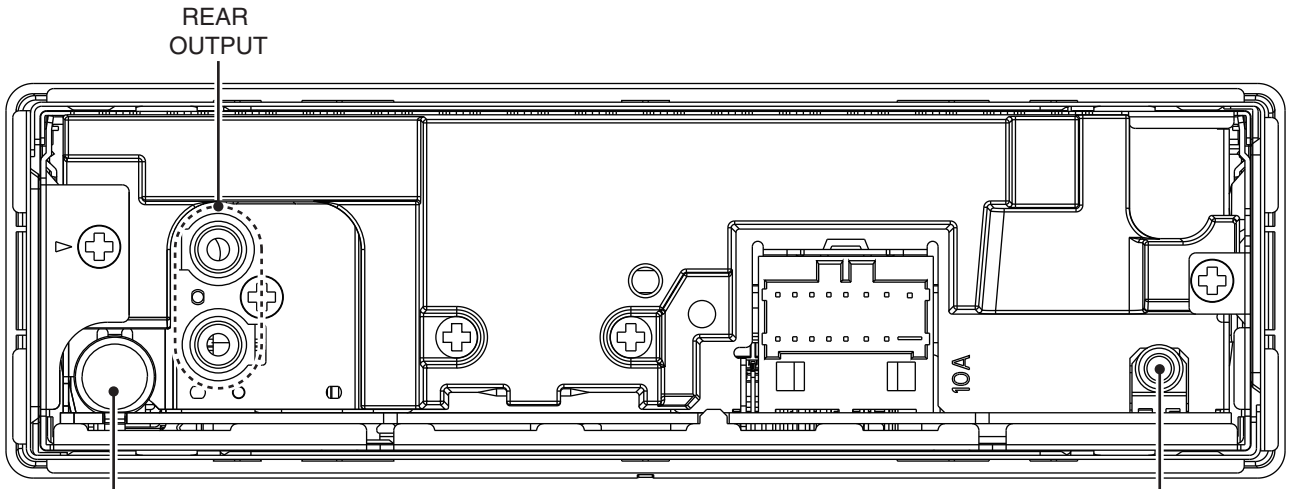
Remarks: Mechanical errors are not displayed (because a CD is turned off in these errors).

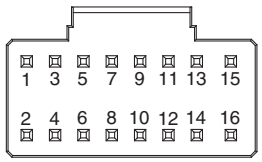
Unreadable TOC does not constitute an error. An intended operation continues in this case.

Upper digits of an error code are subdivided as shown below:

1x: Setup relevant errors, 3x: Search relevant errors, Ax: Other errors.

5.3 CONNECTOR FUNCTION DESCRIPTION





1	FR+	9	MUTE
2	RR+	10	NC
3	FR-	11	B.REM
4	RR-	12	NC
5	FL+	13	A.ANT
6	RL+	14	ACC
7	FL-	15	GND
8	RL-	16	B.UP

6. SERVICE MODE

6.1 DISPLAY TEST MODE

1. To enter the test mode

Turn on ACC and Backup while pressing the 1 and the 3 buttons together.

2. To exit from the test mode

Turn off the ACC and Backup.

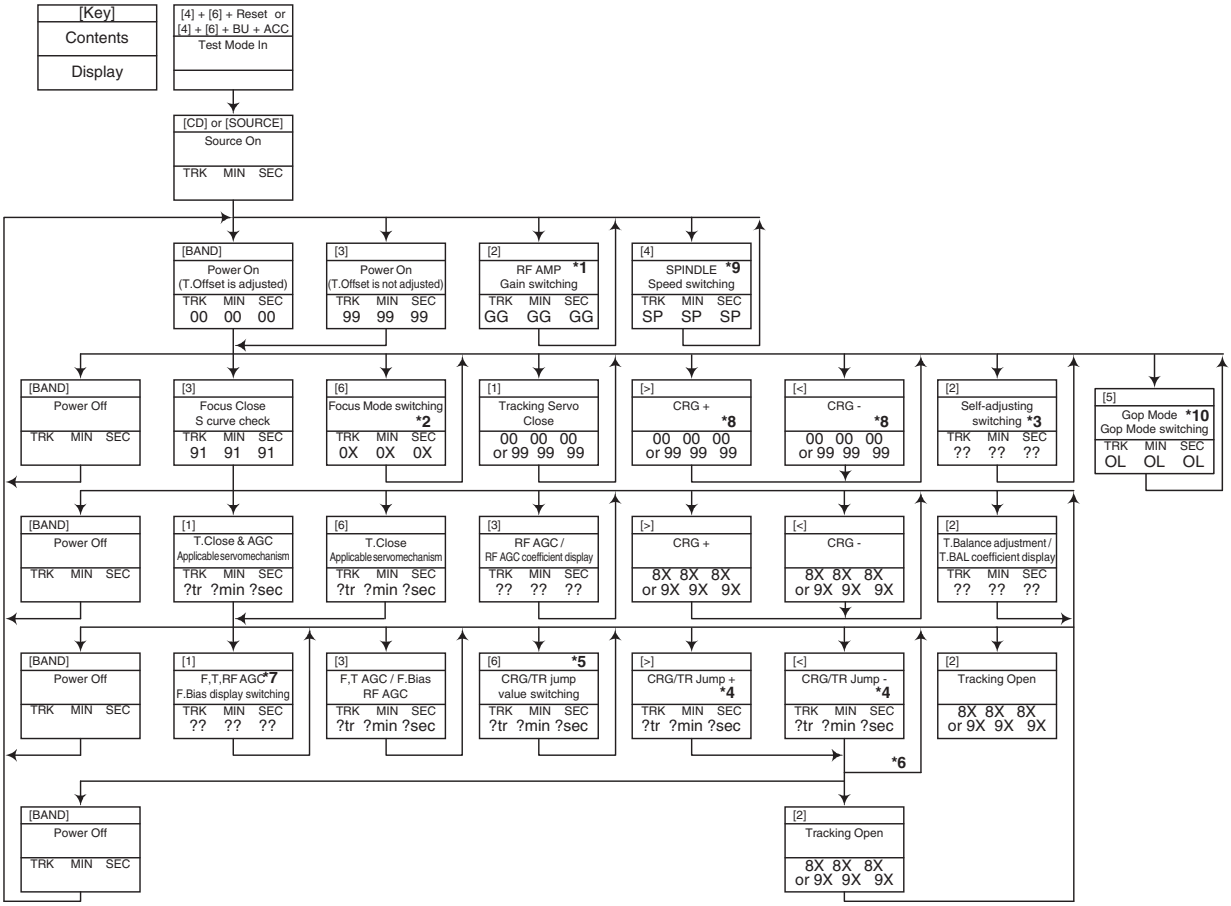
3. Operation method

Change display as follows by pushing the 1 and the 3 buttons together.

All lighting of display
↓
ROM Correction version display

6.2 CD TEST MODE

● Flow Chart



*1) TYP (TRK MIN SEC) → + 6 dB ($^{TRK}06^{MIN}06^{SEC}06$) → + 12 dB ($^{TRK}12^{MIN}12^{SEC}12$)

*2) Focus Close → S Curve check setting → F EQ measurement setting
$^{TRK}00^{MIN}00^{SEC}00$ ($^{TRK}01^{MIN}01^{SEC}01$) ($^{TRK}02^{MIN}02^{SEC}02$)
($^{TRK}99^{MIN}99^{SEC}99$)

*3) F.Offset Display → RF.Offset → T.Offset Display → Switch to the order of the original display

*4) 1TR/4TR/10TR/32TR/100TR

*5) Single → 4TR → 10TR → 32TR → 100TR → CRG Move
9x(8x):91(81) 92(82) 93(83) 94(84) 95(85) 96(86)

*6) Only at the time of CRG move, 100TR jump

*7) TRK/MIN/SEC → F.AGC → T.AGC Gain → F.Bias → RF AGC

*8) CRG motor voltage = 2 [V]

*9) TYP (1X) (TRK MIN SEC) → 2X ($^{TRK}22^{MIN}22^{SEC}22$) → 1X ($^{TRK}11^{MIN}11^{SEC}11$)

*10) OFF(TYP) (TRK MIN SEC) → FORCUS ($^{TRK}70^{MIN}70^{SEC}70$) → TRACKING ($^{TRK}71^{MIN}71^{SEC}71$)

[Key]	Operation Test Mode
[BAND]	Power On/Off
[>]	CRG + / TR Jump + (Direction of the external surface)
[<]	CRG - / TR Jump - (Direction of the internal surface)
[1]	T. CLS & AGC & Applicable servomechanism / AGC,AGC display setting
[2]	RF Gain switching / Offset adjustment display / T.Balance adjustment / T. Open
[3]	F. Close,S Curve / Rough Servo and RF AGC / F,T,RF AGC
[4]	SPDL 1X/2X switching As for the double speed(2x), audio output cannot be supported.
[5]	Error Rate measurement ON : ERR 30Counts Start BER display data[%]
[6]	F. Mode switching / Tracking Close / CRG•TR Jump Switching

• As for the double speed (2x), audio output cannot be supported

*) • After the [Eject] key is pressed keys other than the [Eject] key should not be pressed, until disc ejection is complete.
• When the key [2] or [3] is pressed during the Focus Search, the power supply should be immediately turned off (otherwise the lens sticks to Wall, causing the actuator to be damaged).
• In the case of TR jump other than to 100TR, the function shall continue to be processed even if the TR jump key is released. As for the CRG Move and 100TR Jump, the mechanism shall be set to the Tracking Close mode when the key is released.
• When the power is turned on/off the jump mode is reset to the Single TR (91) while the gain of the RFAMP is reset to 0 dB. At the same time all the self-adjusting values shall return to the default setting.

7. DISASSEMBLY

While the photograph shown is slightly different from this model in shape, the disassembly procedure is the same.

●Removing the Case (not shown)

1. Remove the Case.

●Removing the CD Mechanism Module (Fig.1)

1 Release the two latches and then remove the Panel Assy.

2 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module.

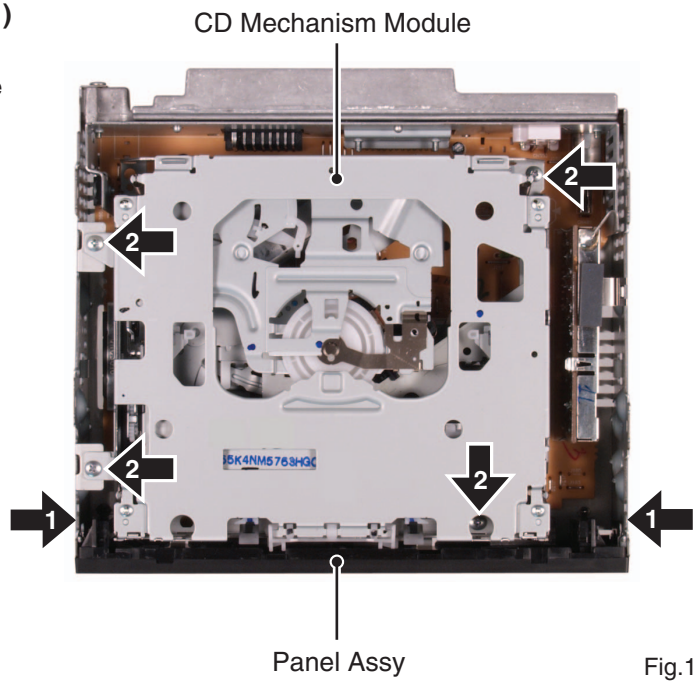


Fig.1

●Removing the Tuner Amp Unit (Fig.2)

1 Remove the screw.

2 Remove the screw.

3 Remove the two screws.

4 Remove the two screws.

5 Straighten the tabs at two locations indicated and then remove the Tuner Amp Unit.

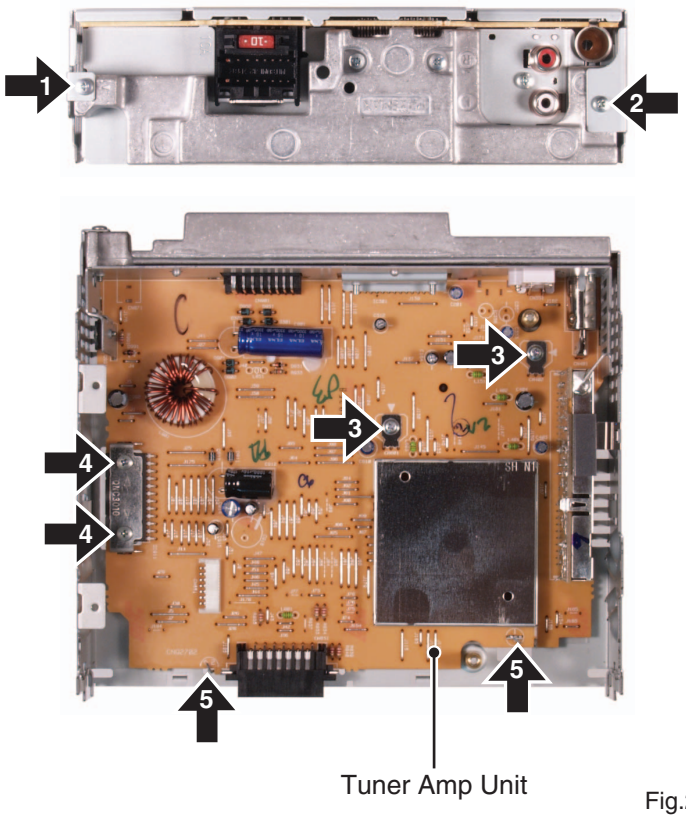
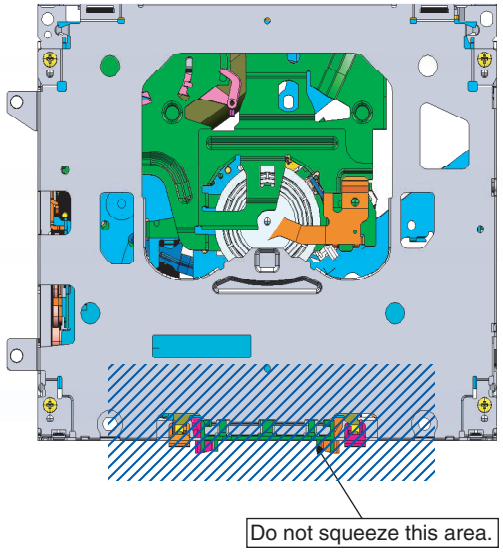


Fig.2

● How to hold the Mechanism Unit

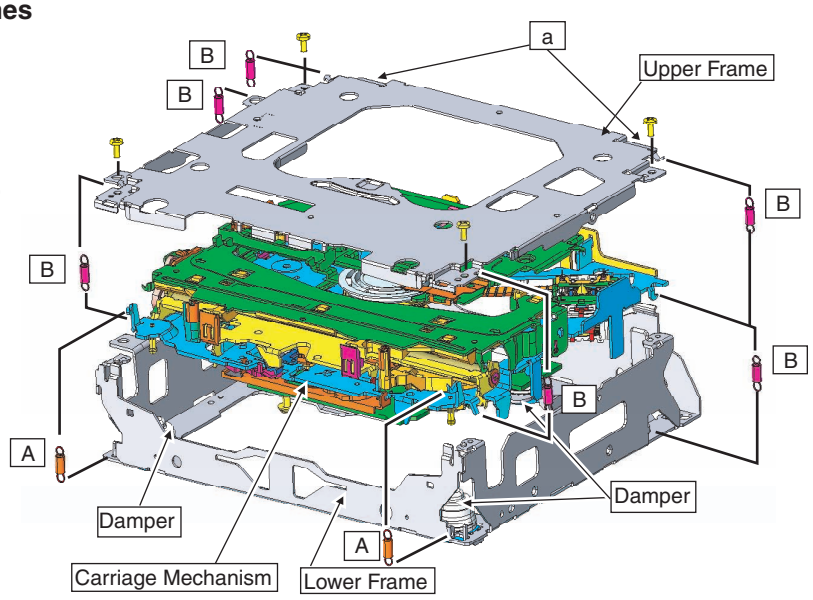
1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.



● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

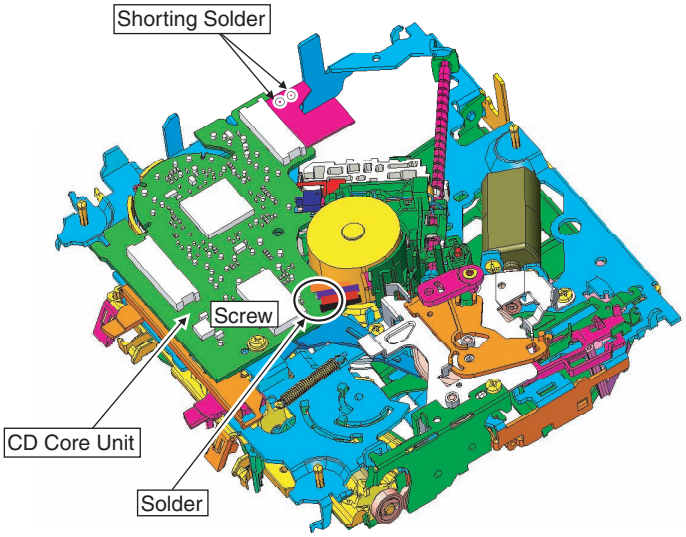
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.



● How to remove the CD Core Unit

1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

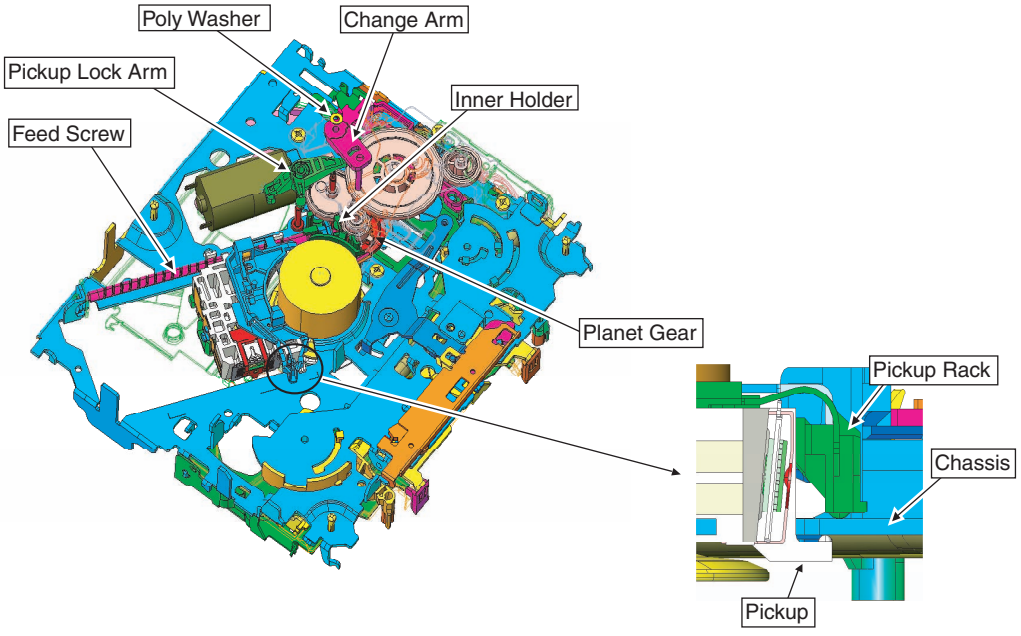
Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.



● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.
Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



8. EACH SETTING AND ADJUSTMENT
8.1 CD ADJUSTMENT

1) Cautions on adjustments

• In this product the single voltage (3.3 V) is used for the regulator. The reference voltage is the REFO1 (1.65 V) instead of the GND.
If you should mistakenly short the REFO1 with the GND during adjustment, accurate voltage will not be obtained, and the servo's misoperation will apply excessive shock to the pickup. To avoid such problems:
a. Do not mix up the REFO1 with the GND when connecting the (-) probe of measuring instruments. Especially on an oscilloscope, avoid connecting the (-) probe for CH1 to the GND.
b. In many cases, measuring instruments have the same potential as that for the (-) probe. Be sure to set the measuring instruments to the floating state.
c. If you have mistakenly connected the REFO1 to the GND, turn off the regulator or the power immediately.

• Before mounting and removing filters or leads for adjustment, be sure to turn off the regulator.

• For stable circuit operation, keep the mechanism operating for about one minute or more after the regulator is turned on.

• In the test mode, any software protections will not work. Avoid applying any mechanical or electrical shock to the mechanism during adjustment.

• The RFI and RFO signals with a wide frequency range are easy to oscillate. When observing the signals, insert a resistor of 1k ohms in series.

• The load and eject operation is not guarantied with the mechanism upside down. If the mechanism is blocked due to mistaken eject operation, reset the product or turn off and on the ACC to restore it.

2) Test mode

This mode is used to adjust the CD mechanism module.
• To enter the test mode.
While pressing the 4 and 6 keys at the same time, reset.
• To exit from the test mode.
Turn off the ACC and back up.

Notes:
a. During ejection, do not press any other keys than the EJECT key until the loaded disc is ejected.
b. If you have pressed the (->) key or (<-) key during focus search, turn off the power immediately to protect the actuator from damage caused by the lens stuck.
c. For the TR jump modes except 100TR, the track jump operation will continue even if the key is released.
d. For the CRG move and 100TR jump modes, the tracking loop will be closed at the same time when the key is released.
e. When the power is turned off and on, the jump mode is reset to the single TR (91), the RF amp gain is set to 0 dB, and the auto-adjustment values are reset to the default settings.

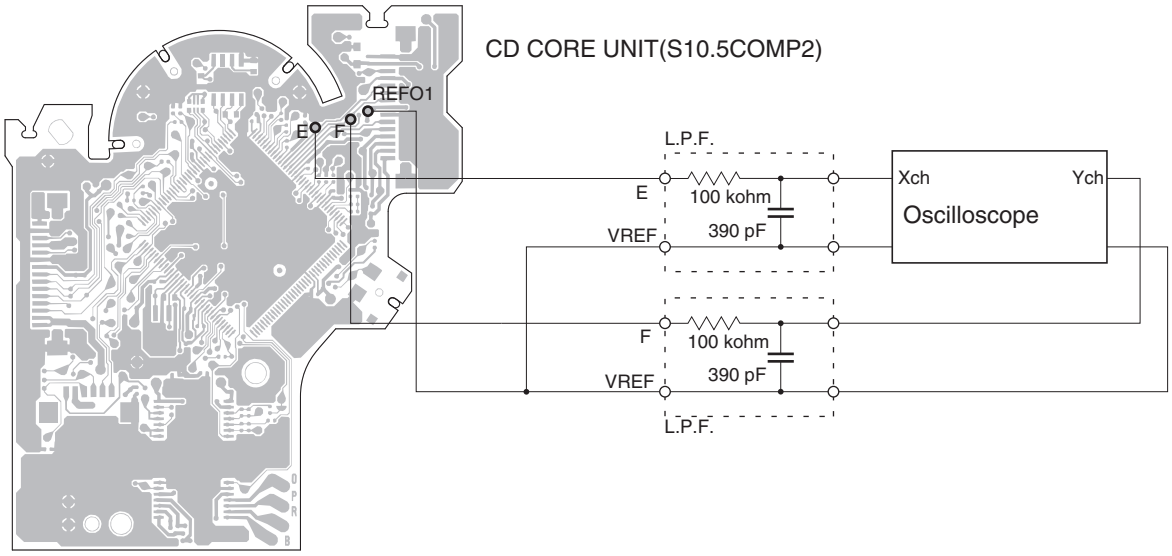
8.2 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT

- Note :
  The grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

- Purpose :
  To check that the grating is within an acceptable range when the PU unit is changed.

- Symptoms of Mal-adjustment :
  If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or taking a long time for track searching.

- Method :
- Measuring Equipment • Oscilloscope, Two L.P.F.
- Measuring Points • E, F, REFO1
- Disc • TCD-782
- Mode • TEST MODE



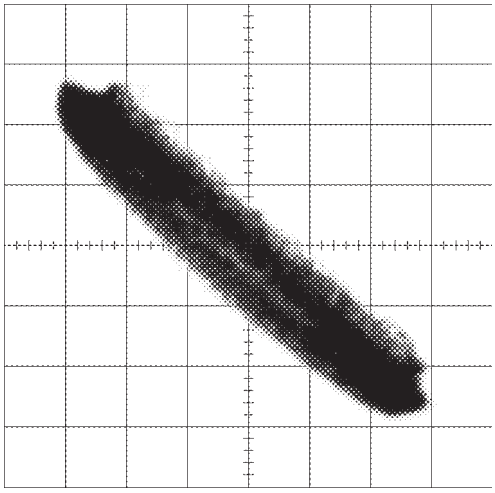
- Checking Procedure
1. In test mode, load the disc and switch the 3 V regulator on.
2. Using the -> and <- buttons, move the PU unit to the innermost track.
3. Press key 3 to close focus, the display should read "91". Press key 2 to implement the tracking balance adjustment the display should now read "81". Press key 3. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75 degrees. Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75 degrees try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75 degrees then the mechanism should be judged to be at fault.

- Note
  Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.
- Hint
  Reloading the disc changes the clamp position and may decrease the "wobble".

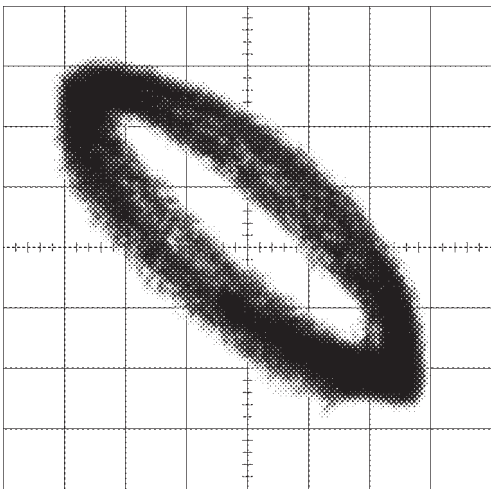
Grating waveform

Ech -> Xch 20 mV/div, AC
Fch -> Ych 20 mV/div, AC

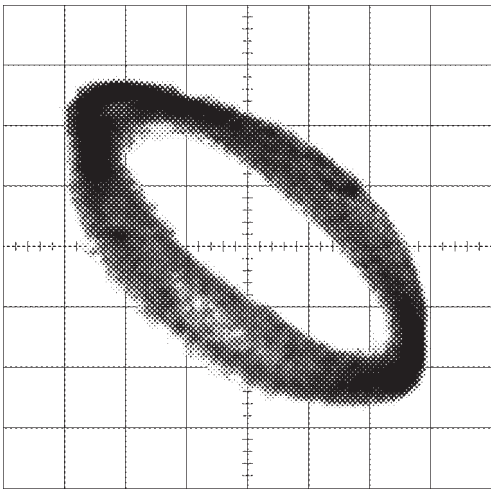
0 degrees



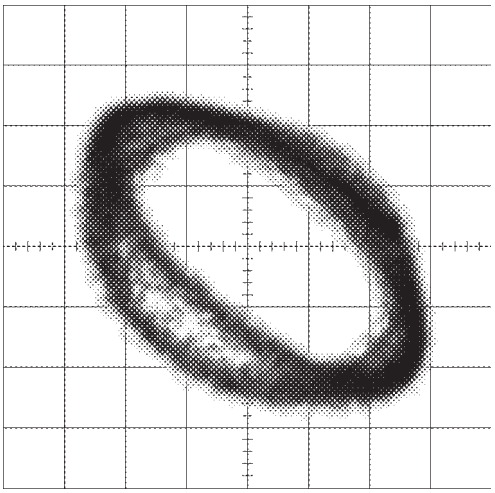
30 degrees



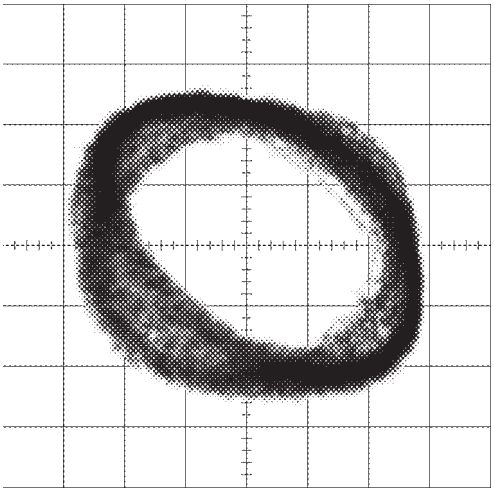
45 degrees



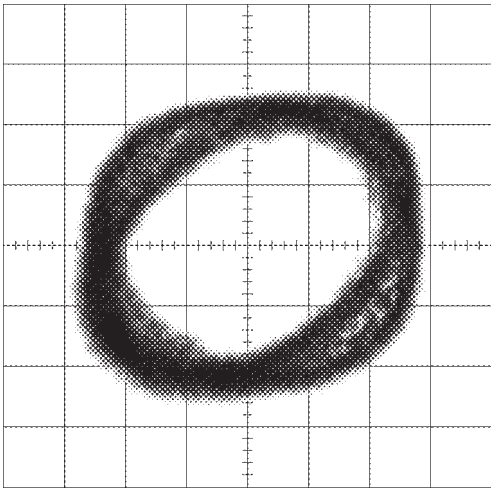
60 degrees



75 degrees



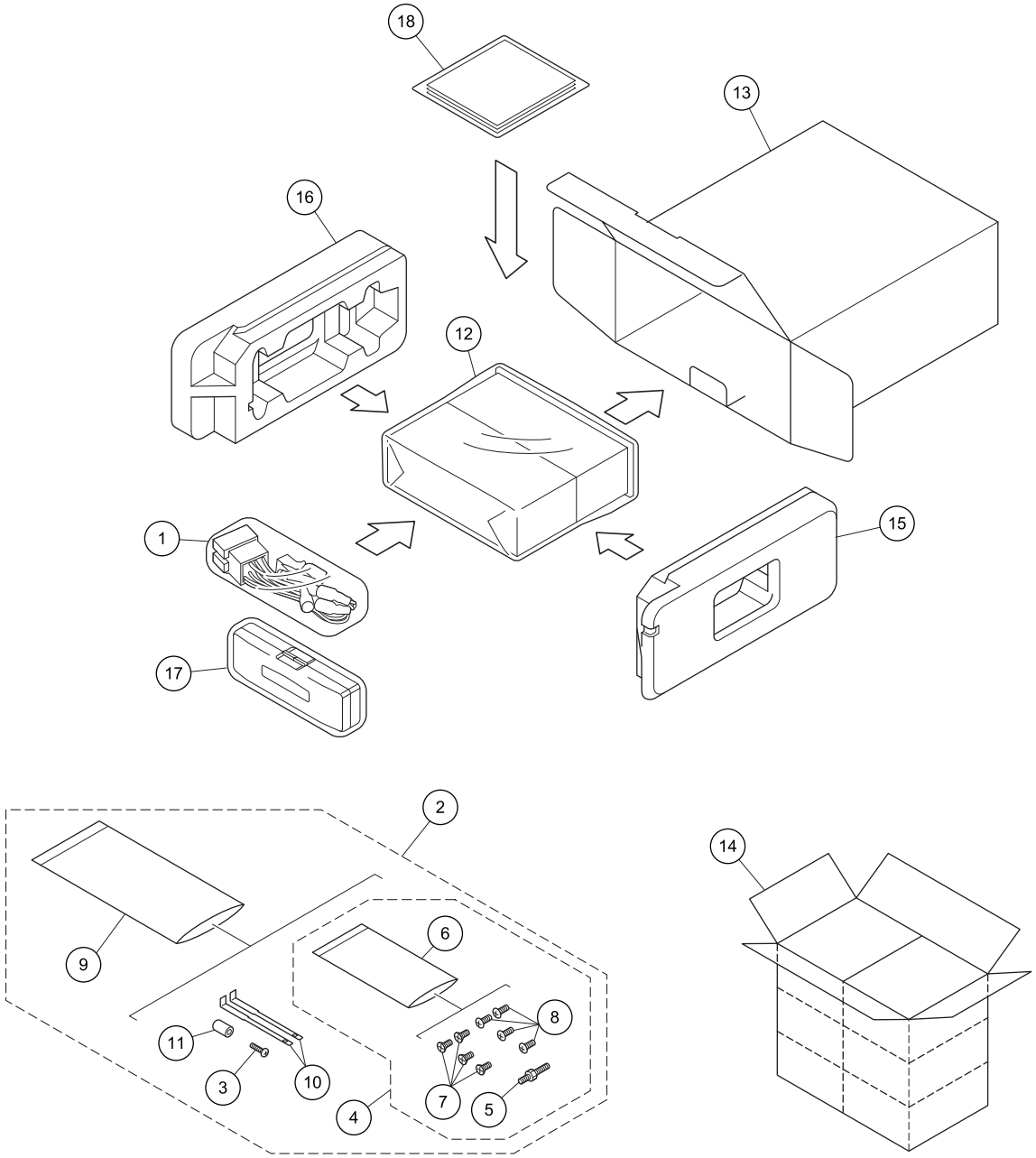
90 degrees



9. EXPLODED VIEWS AND PARTS LIST

NOTES : • *Parts marked by " * " are generally unavailable because they are not in our Master Spare Parts List.*
• *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
• *Screw adjacent to▽ mark on the product are used for disassembly.*
• *For the applying amount of lubricants or glue, follow the instructions in this manual. (In the case of no amount instructions,apply as you think it appropriate.)*

9.1 PACKING



(1) PACKING SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Cord Assy	CDP1015
	2	Accessory Assy	CEA6707
	3	Screw	BPZ20P080FTC
	4	Screw Assy	CEA3849
	5	Screw	CBA1650
*	6	Polyethylene Bag	CEG-127
	7	Screw	CRZ50P090FTC
	8	Screw	TRZ50P080FTC
	9	Polyethylene Bag	CEG1160
	10	Handle	CND3707
	11	Bush	CNV3930
	12	Polyethylene Bag	CEG-162
	13	Unit Box	See Contrast table(2)
	14	Contain Box	See Contrast table(2)
	15	Protector	YHP5050
	16	Protector	YHP5051
	17	Case Assy	YXB5009
*	18-1	Warranty Card	CRY1279
	18-2	Owner's Manual	QRD3013
	18-3	Installation Manual	QRD3015

(2) CONTRAST TABLE

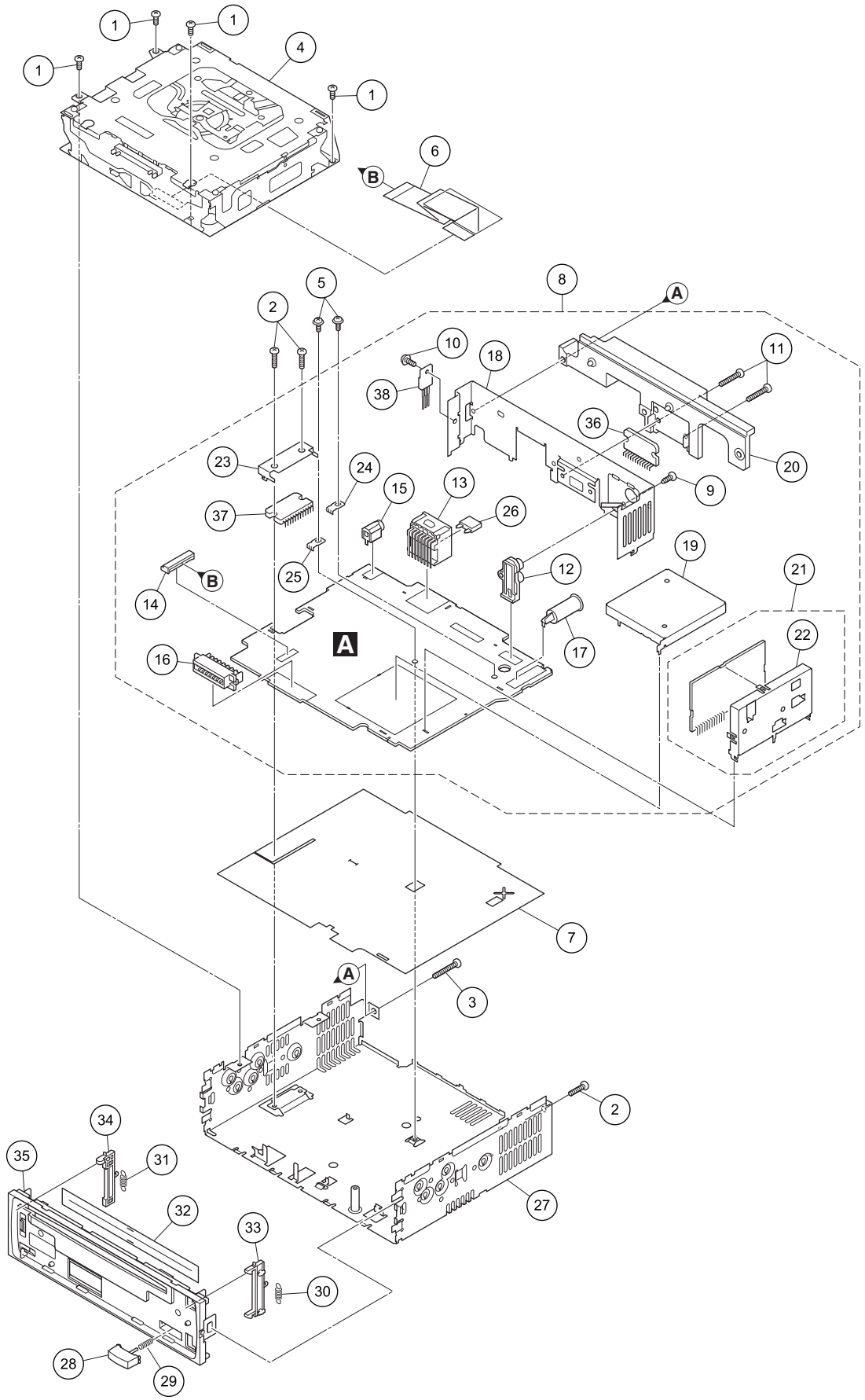
DEH-1100MPB/XN/EW5, DEH-1100MP/XN/EW5 and DEH-1120MP/XN/EW5 are constructed the same except for the following:

Mark	No.	Description	DEH-1100MPB/XN/EW5	DEH-1100MP/XN/EW5	DEH-1120MP/XN/EW5
	13	Unit Box	QHG3018	QHG3015	QHG3017
	14	Contain Box	QHL3018	QHL3015	QHL3017

Owner's Manual,Installation Manual

Part No.	Language
QRD3013	English, Spanish(Espanol), German, French, Italian, Dutch, Russian
QRD3015	English, Spanish(Espanol), German, French, Italian, Dutch, Russian

9.2 EXTERIOR(1)



(1) EXTERIOR(1) SECTION PARTS LIST

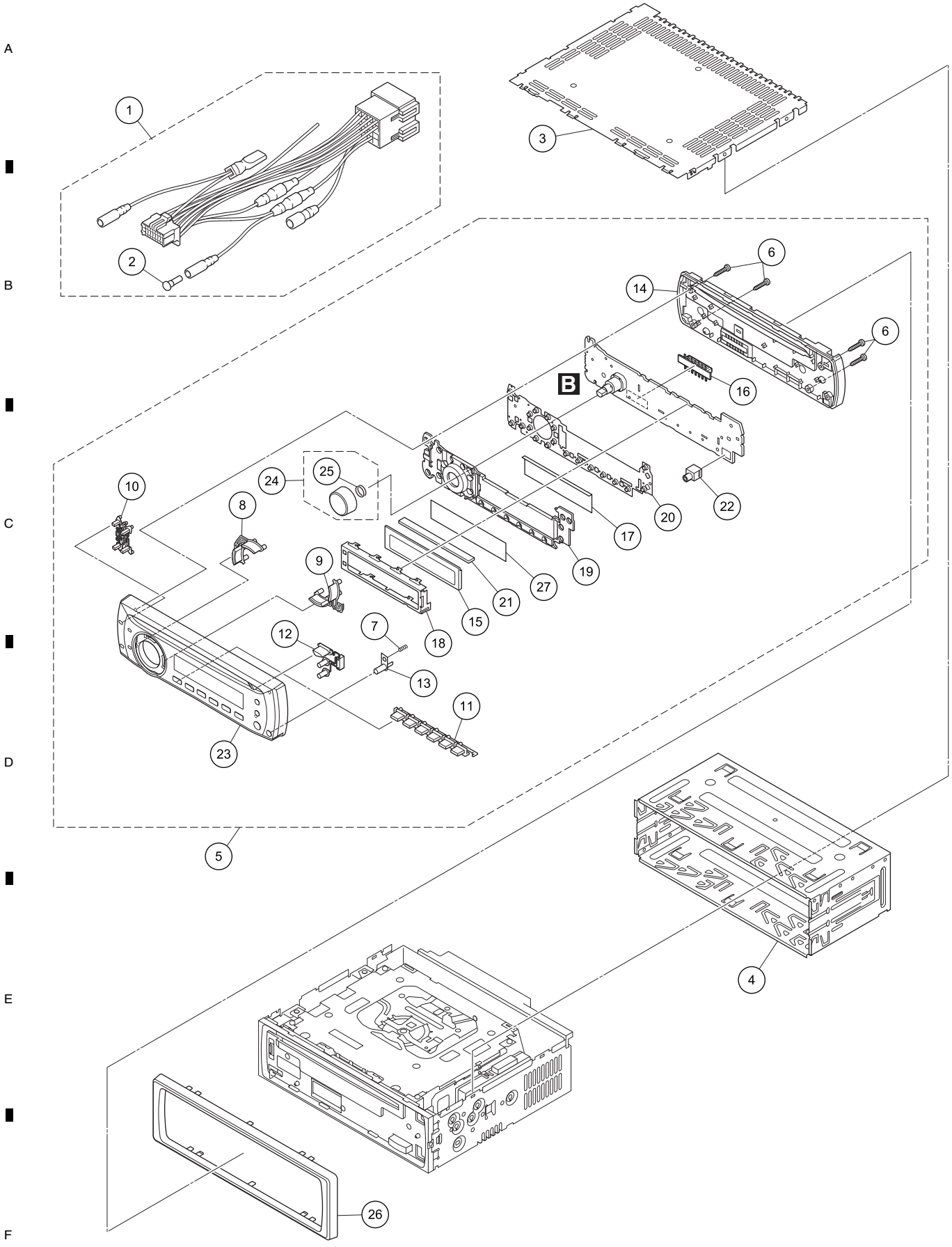
Mark	No.	Description	Part No.
	1	Screw	BSZ26P060FTC
	2	Screw	BSZ26P100FTC
	3	Screw	BSZ26P180FTC
	4	CD Mechanism Module(S10.5)	CXK5763
	5	Screw	ISS26P055FTC
	6	Cable	QDE3003
	7	Insulator	QNM3015
	8	Tuner Amp Unit	QWM3032
	9	Screw	BPZ26P080FTC
	10	Screw	BSZ26P060FTC
	11	Screw	BSZ26P160FTC
	12	Pin Jack(CN351)	CKB1057
	13	Plug(CN901)	CKM1376
	14	Connector(CN651)	CKS3829
	15	Connector(CN871)	CKS4124
	16	Connector(CN831)	CKS5664
	17	Antenna Jack(CN401)	CKX1070
	18	Holder	CND3705
	19	Holder	CND3706
	20	Heat Sink	CNR1668
	21	FM/AM Tuner Unit	CWE2106
	22	Holder	CND3466
	23	Holder	QNC3010
	24	Terminal(CN402)	VNF1084
	25	Terminal(CN601)	VNF1084
⚠	26	Fuse(10 A)	YEK5001
	27	Chassis Unit	See Contrast table(2)
	28	Button	CAC4836
	29	Spring	CBH2367
	30	Spring(Silver)	CBH2961
	31	Spring(Black)	CBH2962
	32	Cover	CNN1665
	33	Arm	CNV9311
	34	Arm	CNV9312
	35	Panel	QNS3023
	36	IC(IC301)	PAL010A
	37	IC(IC911)	BA49181-V12
	38	Transister(Q991)	2SD2396

(2) CONTRAST TABLE

DEH-1100MPB/XN/EW5, DEH-1100MP/XN/EW5 and DEH-1120MP/XN/EW5 are constructed the same except for the following:

Mark	No.	Description	DEH-1100MPB/XN/EW5	DEH-1100MP/XN/EW5	DEH-1120MP/XN/EW5
	27	Chassis Unit	QXA3068	QXA3066	QXA3067

9.3 EXTERIOR(2)



(1) EXTERIOR(2) SECTION PARTS LIST

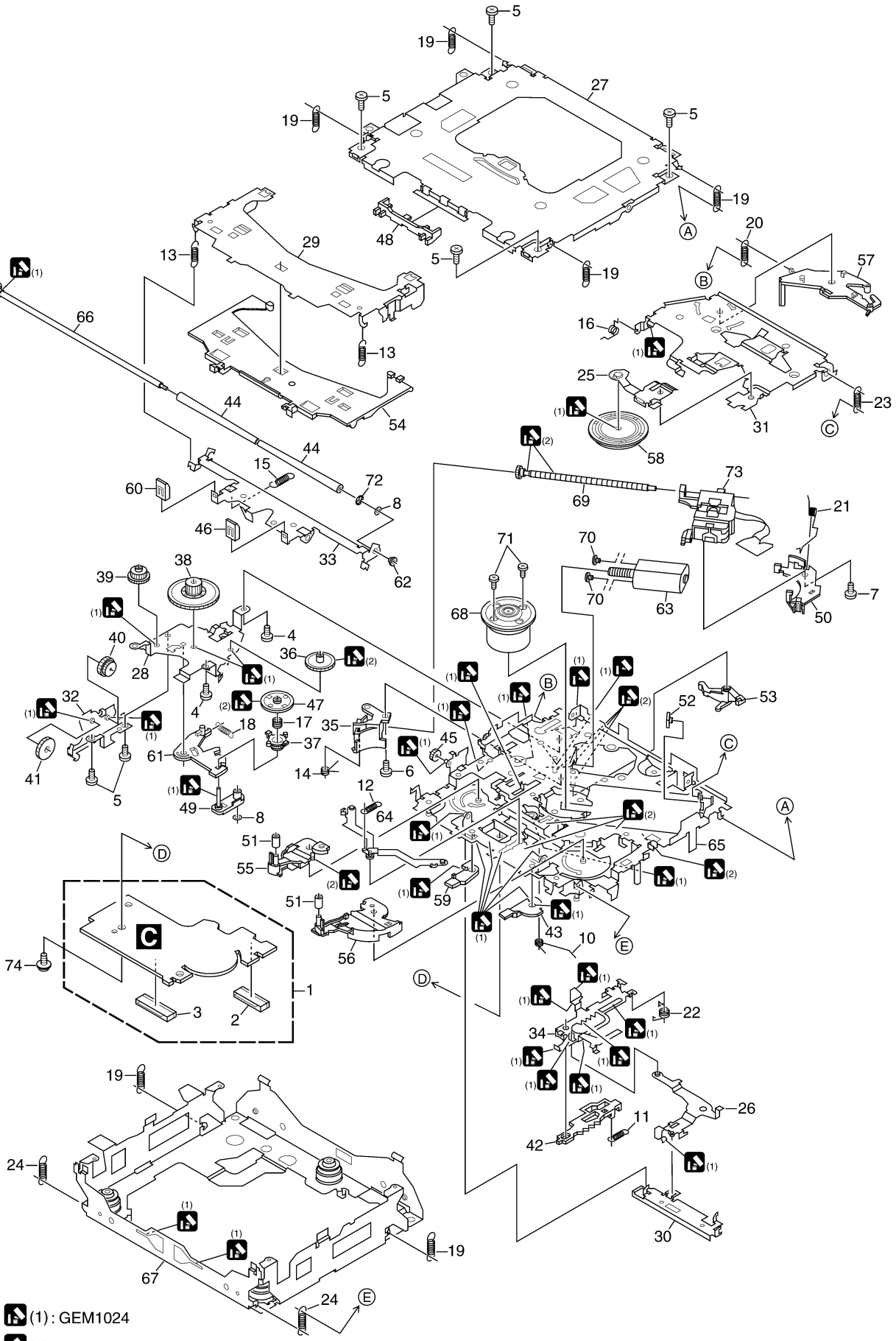
Mark	No.	Description	Part No.
	1	Cord Assy	CDP1015
	2	Terminal Cover	CKX-003
	3	Case	CNB2793
	4	Holder	CND3598
	5	Detachable Assy	See Contrast table(2)
	6	Screw	BPZ20P100FTC
	7	Spring	CBH2210
	8	Button(UP, RIGHT)	QAC3015
	9	Button(DOWN, LEFT)	QAC3016
	10	Button(FUNC, BAND/ESC, AUDIO, EQ/LOUD)	QAC3017
	11	Button(1-6)	QAC3019
	12	Button(EJECT, DISP/SCRL, TA/AF)	QAC3020
	13	Button(DETACH)	QAC3021
	14	Cover	QNS3022
	15	LCD(LCD1801)	See Contrast table(2)
	16	Connector(CN1801)	CKS5663
	17	Sheet	See Contrast table(2)
	18	Holder	QNC3004
	19	Lighting Conductor	QNV3004
	20	Rubber	QNV3005
	21	Connector	QNV3007
	22	Jack(CN1802)	YKN5001
	23	Grille Unit	See Contrast table(2)
	24	Knob Unit	See Contrast table(2)
	25	Spring	YBL5010
	26	Panel	YNS5406
	27	Sheet	See Contrast table(2)

(2) CONTRAST TABLE

DEH-1100MPB/XN/EW5, DEH-1100MP/XN/EW5 and DEH-1120MP/XN/EW5 are constructed the same except for the following:

Mark	No.	Description	DEH-1100MPB/XN/EW5	DEH-1100MP/XN/EW5	DEH-1120MP/XN/EW5
	5	Detachable Assy	QXA3075	QXA3073	QXA3074
	15	LCD(LCD1801)	CAW1932	CAW1927	CAW1927
	17	Sheet	CNN1382	Not used	Not used
	23	Grille Unit	QXA3054	QXA3052	QXA3053
	24	Knob Unit	QXA3064	QXA3072	QXA3064
	27	Sheet	CNN1381	Not used	Not used

9.4 CD MECHANISM MODULE



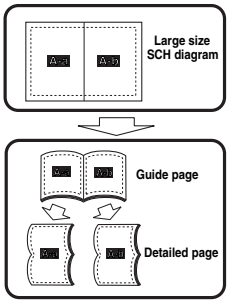
CD MECHANISM MODULE SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	CD Core Unit(S10.5COMP2)	CWX3514
	2	Connector(CN101)	CKS4911
	3	Connector(CN701)	CKS4808
	4	Screw	BMZ20P025FTC
	5	Screw	BSZ20P040FTC
	6	Screw(M2 x 3)	CBA1511
	7	Screw(M2 x 4)	CBA1835
	8	Washer	CBF1038
	9	•••••	
	10	Spring	CBH2609
	11	Spring	CBH2612
	12	Spring	CBH2614
	13	Spring	CBH2616
	14	Spring	CBH2617
	15	Spring	CBH2620
	16	Spring	CBH2855
	17	Spring	CBH2937
	18	Spring	CBH2735
	19	Spring	CBH2854
	20	Spring	CBH2642
	21	Spring	CBH2856
	22	Spring	CBH2857
	23	Spring	CBH2860
	24	Spring	CBH2861
	25	Spring	CBL1686
	26	Arm	CND1909
	27	Frame	CND2582
	28	Bracket	CND2583
	29	Arm	CND3831
	30	Lever	CND2585
	31	Arm	CND2586
	32	Bracket	CND2587
	33	Arm	CND2588
	34	Lever	CND2589
	35	Holder	CNV9522
	36	Gear	CNV7207
	37	Gear	CNV9513
	38	Gear	CNV7209
	39	Gear	CNV9514
	40	Gear	CNV9515
	41	Gear	CNV9516
	42	Rack	CNV9517
	43	Arm	CNV7216
	44	Roller	CNV8189
	45	Gear	CNV9518
	46	Guide	CNV9519
	47	Gear	CNV7595
	48	Guide	CNV9520
	49	Arm	CNV7805
	50	Rack	CNV8342
	51	Roller	CNV8343
	52	Holder	CNV8344
	53	Arm	CNV8345
	54	Guide	CNV9498
	55	Arm	CNV8348
	56	Arm	CNV8349
	57	Arm	CNV8350
	58	Clamper	CNV8365
	59	Arm	CNV8386
	60	Guide	CNV8396
	61	Arm	CNV9521
	62	Collar	CNV8447
	63	Motor Unit(M2)	CXC4026
	64	Arm Unit	CXC4027
	65	Chassis Unit	CXC4028
	66	Gear Unit	CXC4029
	67	Frame Unit	CXC4031
	68	Motor Unit(M1)	CXC7134
	69	Screw Unit	CXC6359
	70	Screw	JFZ20P025FTC
	71	Screw	JGZ17P022FTC
	72	Washer	YE20FTC
	73	Pickup Unit(P10.5)(Service)	CXX1942
	74	Screw	IMS26P030FTC

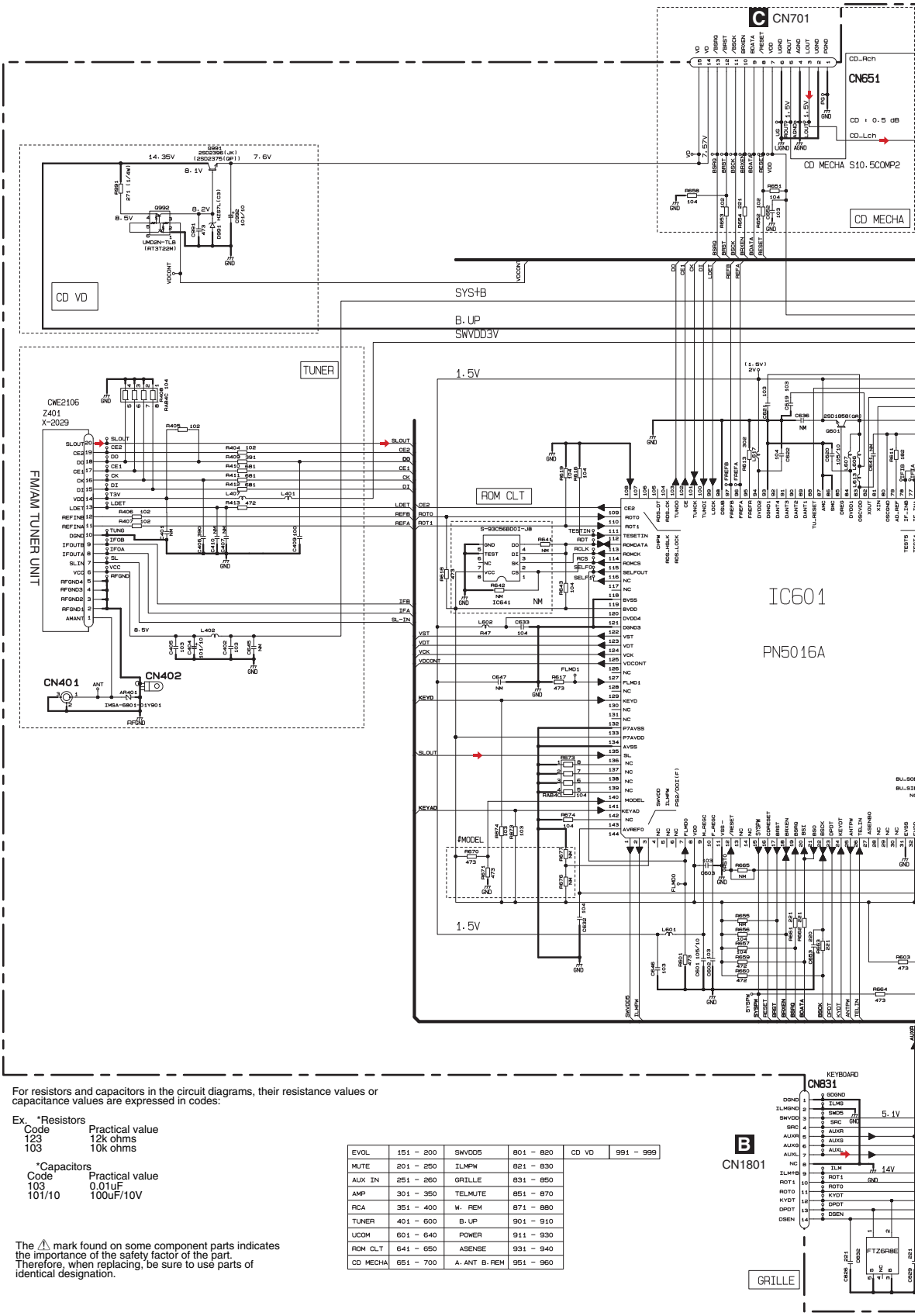
10. SCHEMATIC DIAGRAM

10.1 TUNER AMP UNIT(GUIDE PAGE)

Note: When ordering service parts, be sure to refer to " EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".



A-a



For resistors and capacitors in the circuit diagrams, their resistance values or capacitance values are expressed in codes:

Ex. *Resistors

Code	Practical value
123	12k ohms
103	10k ohms

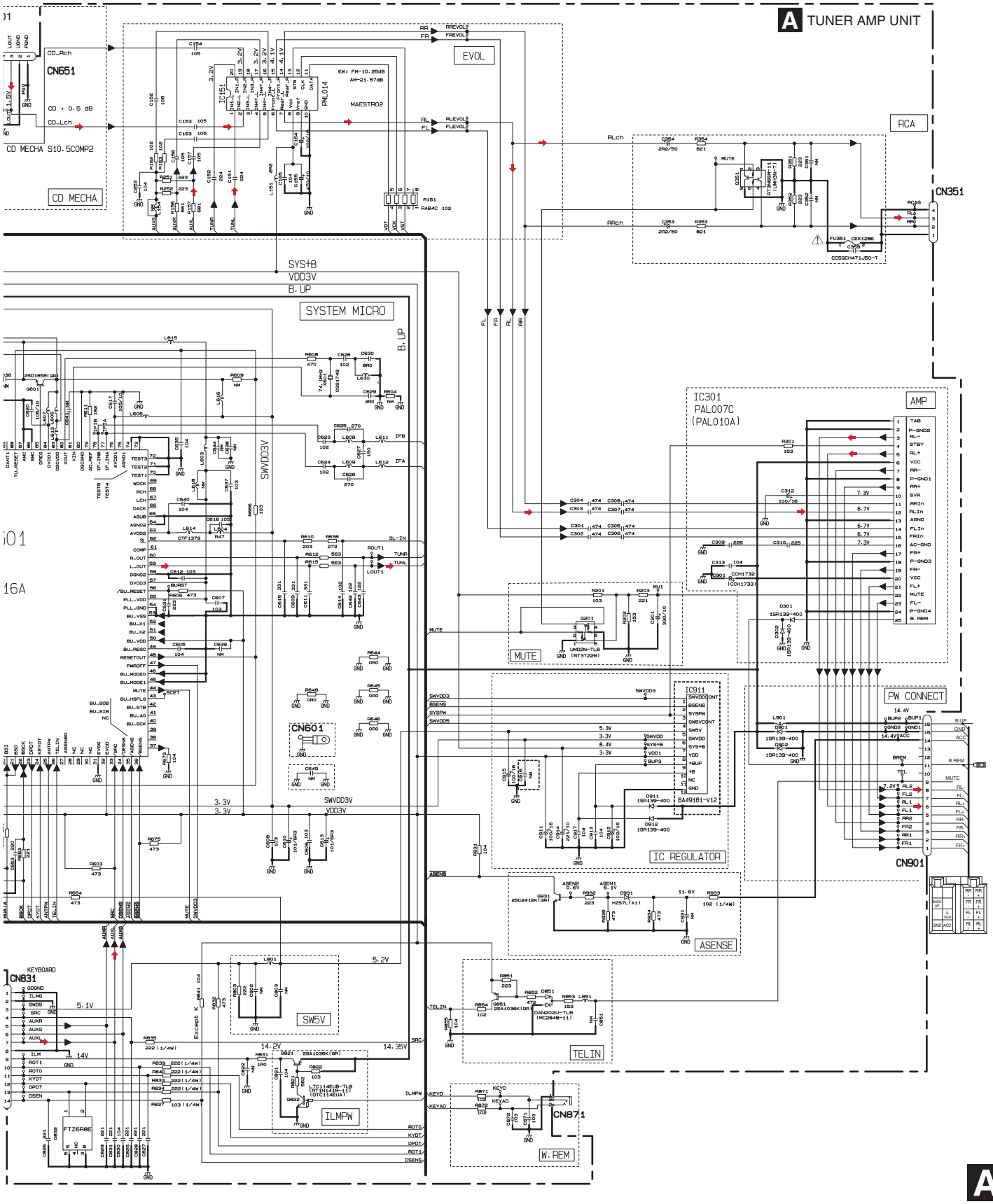
*Capacitors

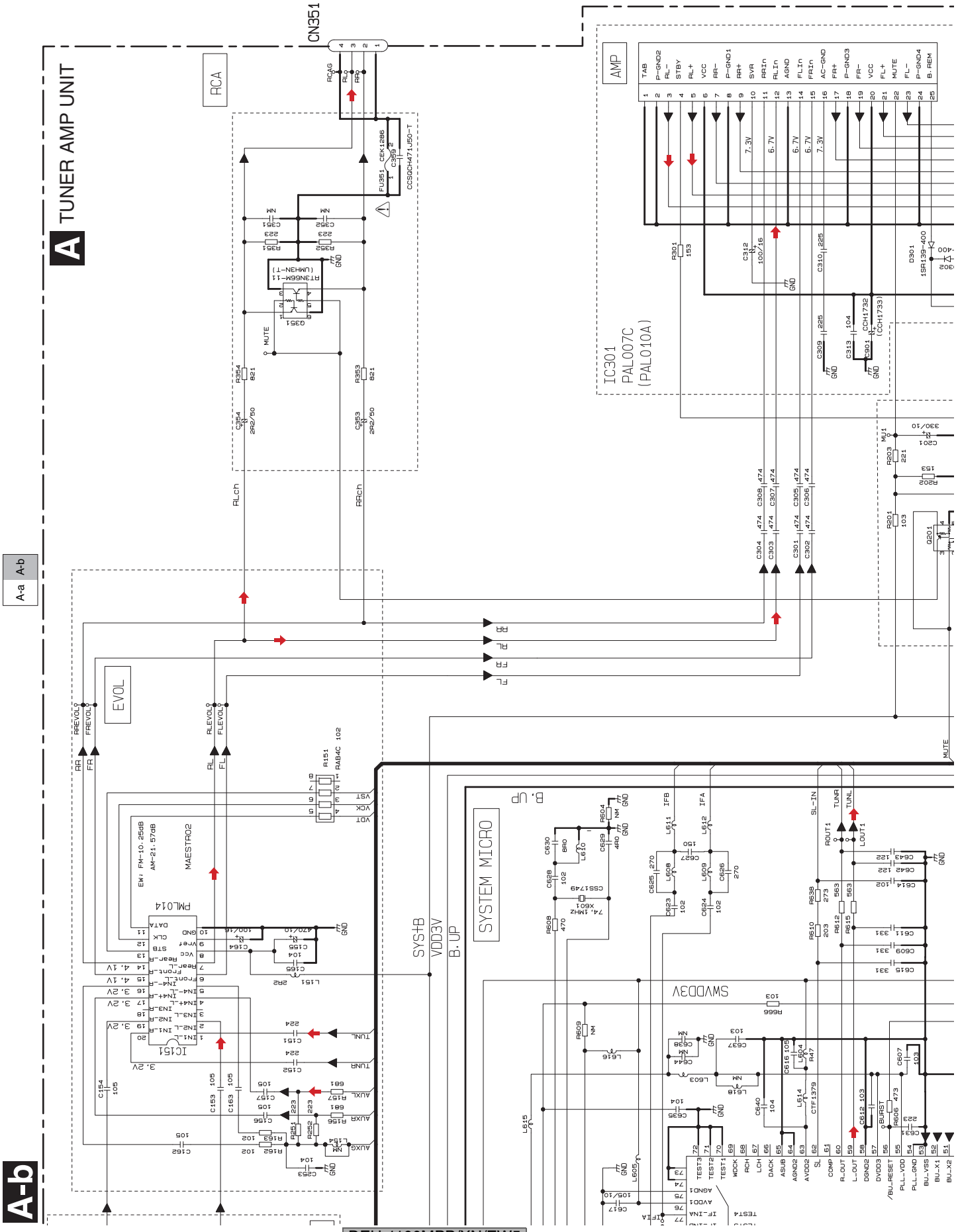
Code	Practical value
103	0.01uF
101/10	100uF/10V

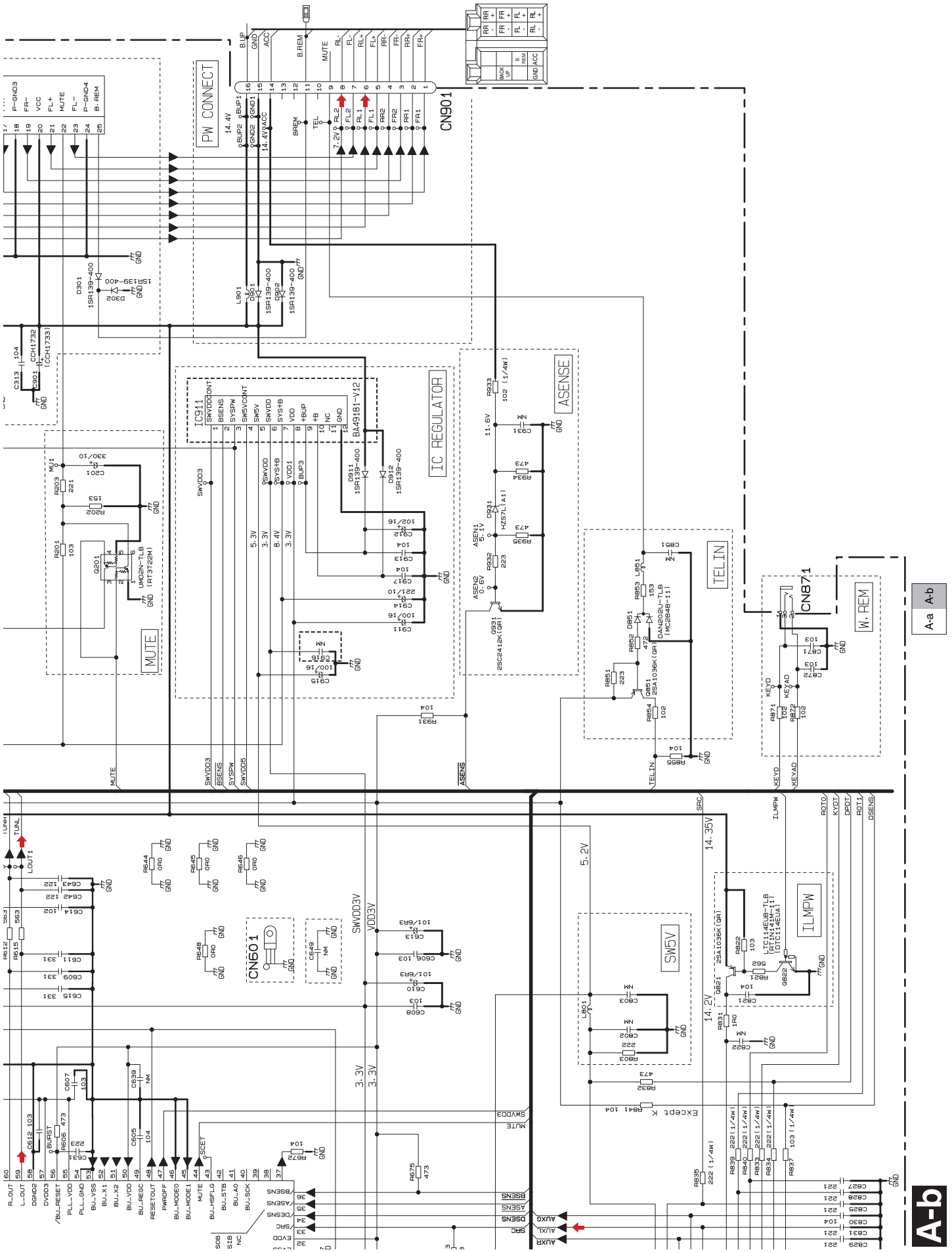
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

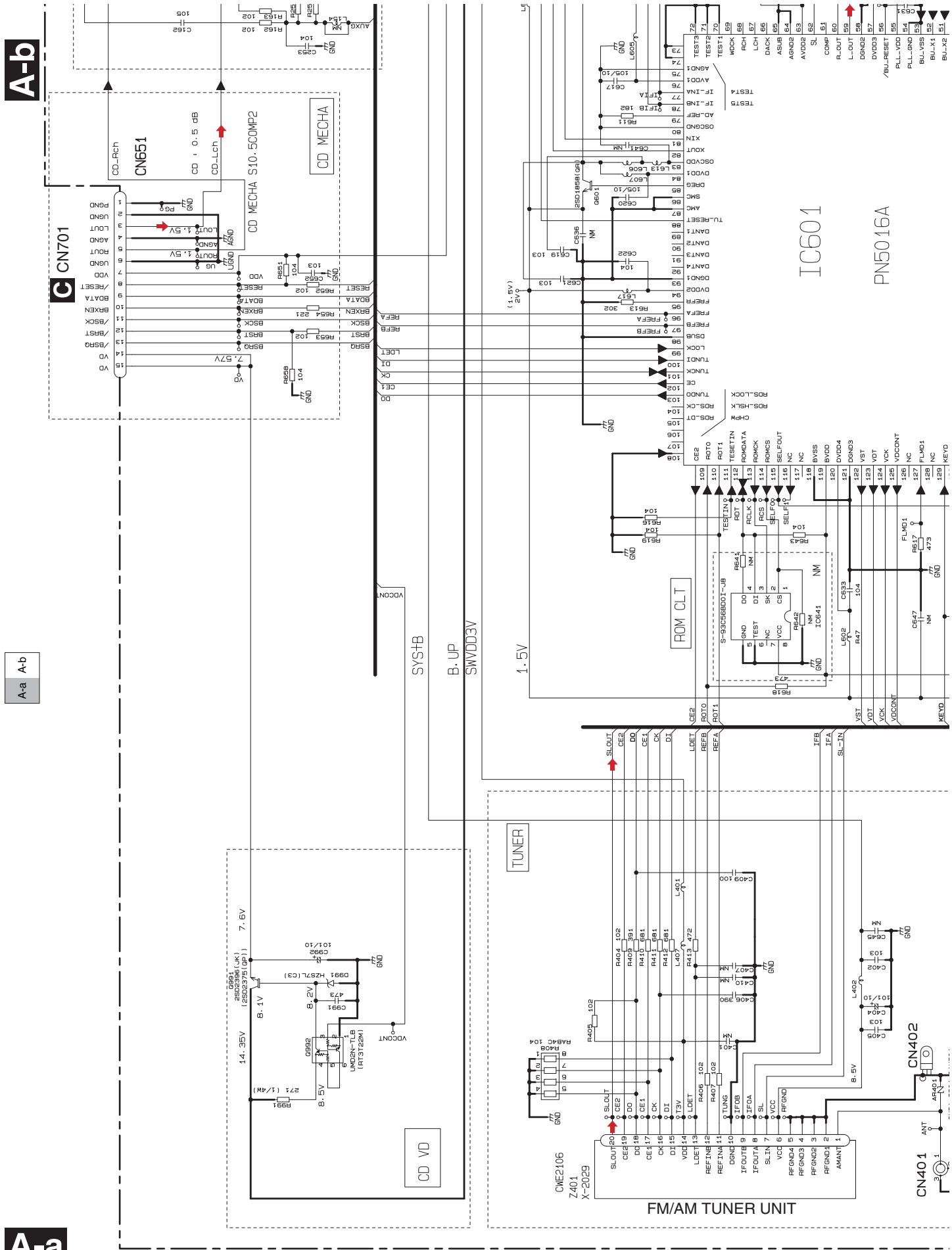
EVOL	151 - 200	SWVDD5	801 - 820	CD VD	991 - 999
MUTE	201 - 250	ILMPW	821 - 830		
AUX IN	251 - 260	GRILLE	831 - 850		
AMP	301 - 350	TELMUTE	851 - 870		
RCA	351 - 400	W. REM	871 - 880		
TUNER	401 - 600	B.UP	901 - 910		
UCOM	601 - 640	POWER	911 - 930		
ROM CLT	641 - 650	ASENSE	931 - 940		
CD MECHA	651 - 700	A.ANT B.REM	951 - 960		

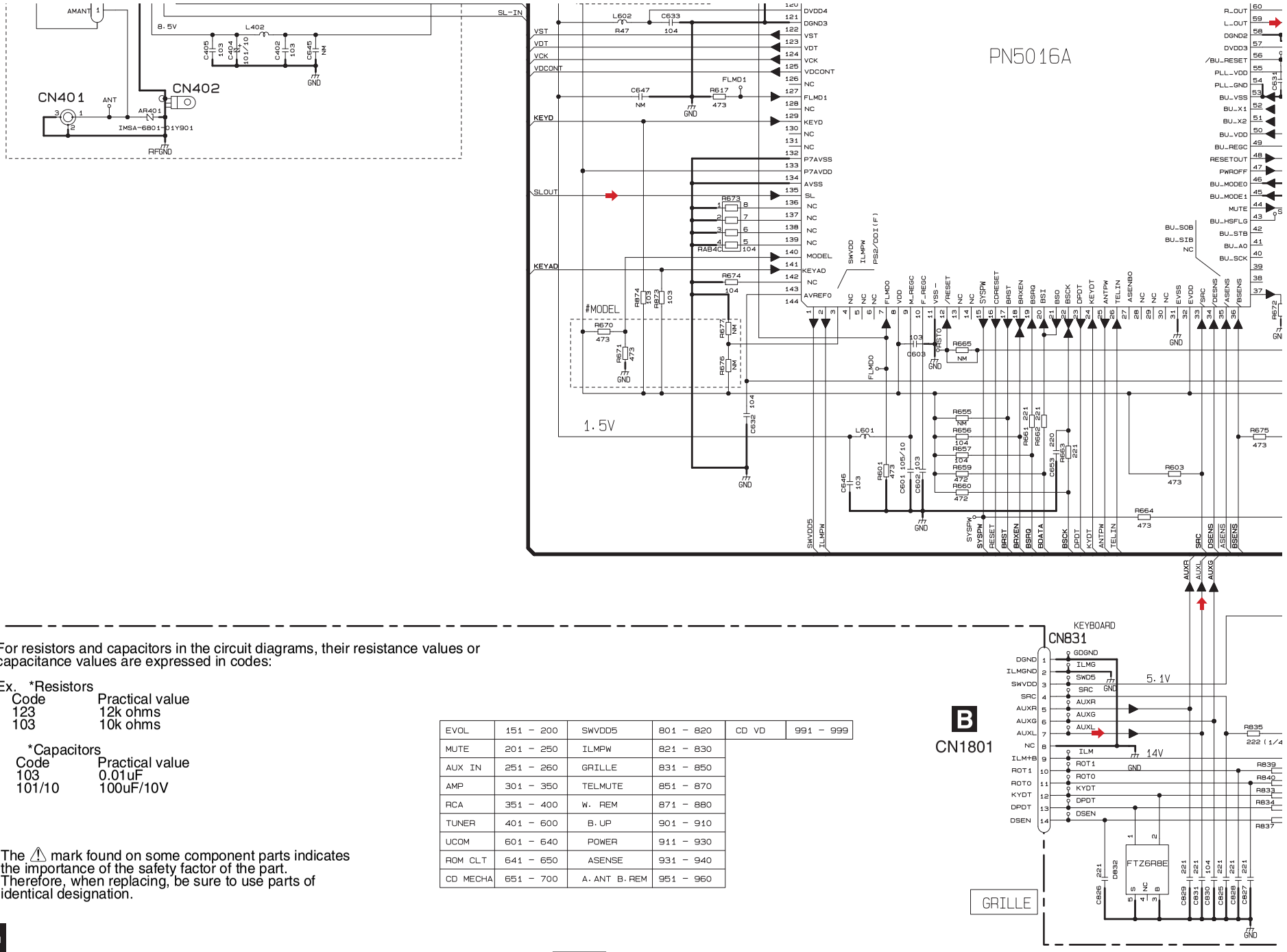
A-b


A TUNER AMP UNIT
CD_Rch
CN651
CD + 0.5 dB
CD_Lch
CD MECHA S10.5COMP2
CD MECHA
EVOL
MAESTRO2
RCA
RLch
RRch
CN351
SYSHB
VDD3V
B.UP
SYSTEM MICRO
SWVDD3V
IC301
PAL007C
(PAL010A)
AMP
MUTE
PW CONNECT
CN901
IC911
IC REGULATOR
ASENSE
TELIN
SW5V
ILMPW
CN831
KEYBOARD
CN871
W.REM
FT26R8E
DEH-1100MPB/XN/EW5


A TUNER AMP UNIT
CN351
RCA
AMP
IC301
PAL007C
(PAL010A)
EVOL
SYSTEM MICRO
SYS+B
VDD3V
B.UP
SWVDD3V
MAESTRO2
PML014
IC151
A-b
A-a
A-b


CN901
PW CONNECT
IC REGULATOR
IC911
BA49181-V12
ASENSE
TELIN
MUTE
W-REM
CN871
CN601
ILMPW
SW5V
A-b
A-a
A-b


A-b
CD MECHA
CD MECHA S10.5COMP2
CD : 0.5 dB
CD_Rch
CD_Lch
CN651
CN701
IC601
PN5016A
ROM CLT
S-93C56BD01-J8
TUNER
CD VD
FM/AM TUNER UNIT
CWE2106
Z401
X-2029
CN402
CN401
SYSHB
B.UP
SWDD3V
1.5V
A-a
A-b



For resistors and capacitors in the circuit diagrams, their resistance values or capacitance values are expressed in codes:

Ex. *Resistors

Code	Practical value
123	12k ohms
103	10k ohms

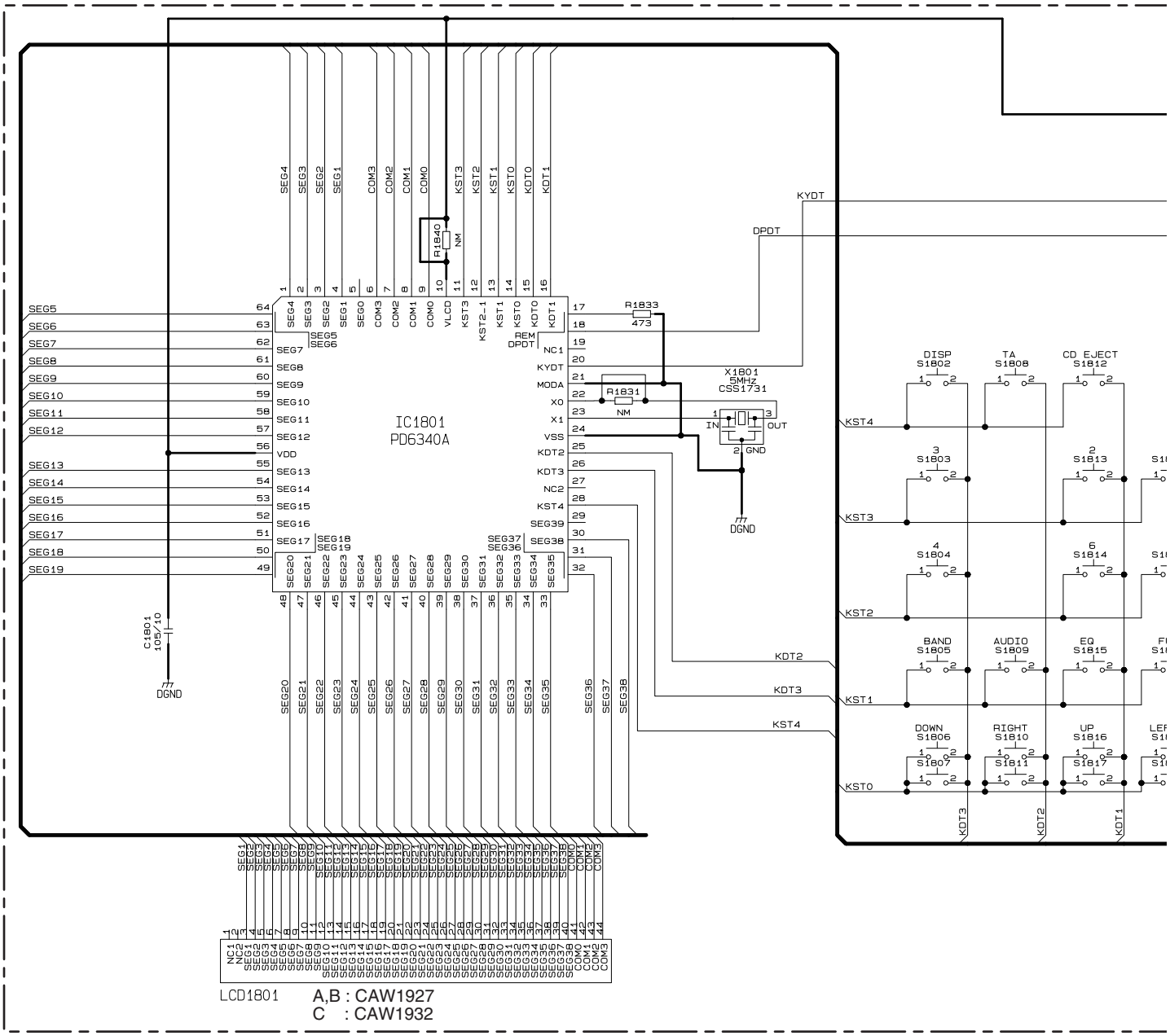
*Capacitors

Code	Practical value
103	0.01uF
101/10	100uF/10V

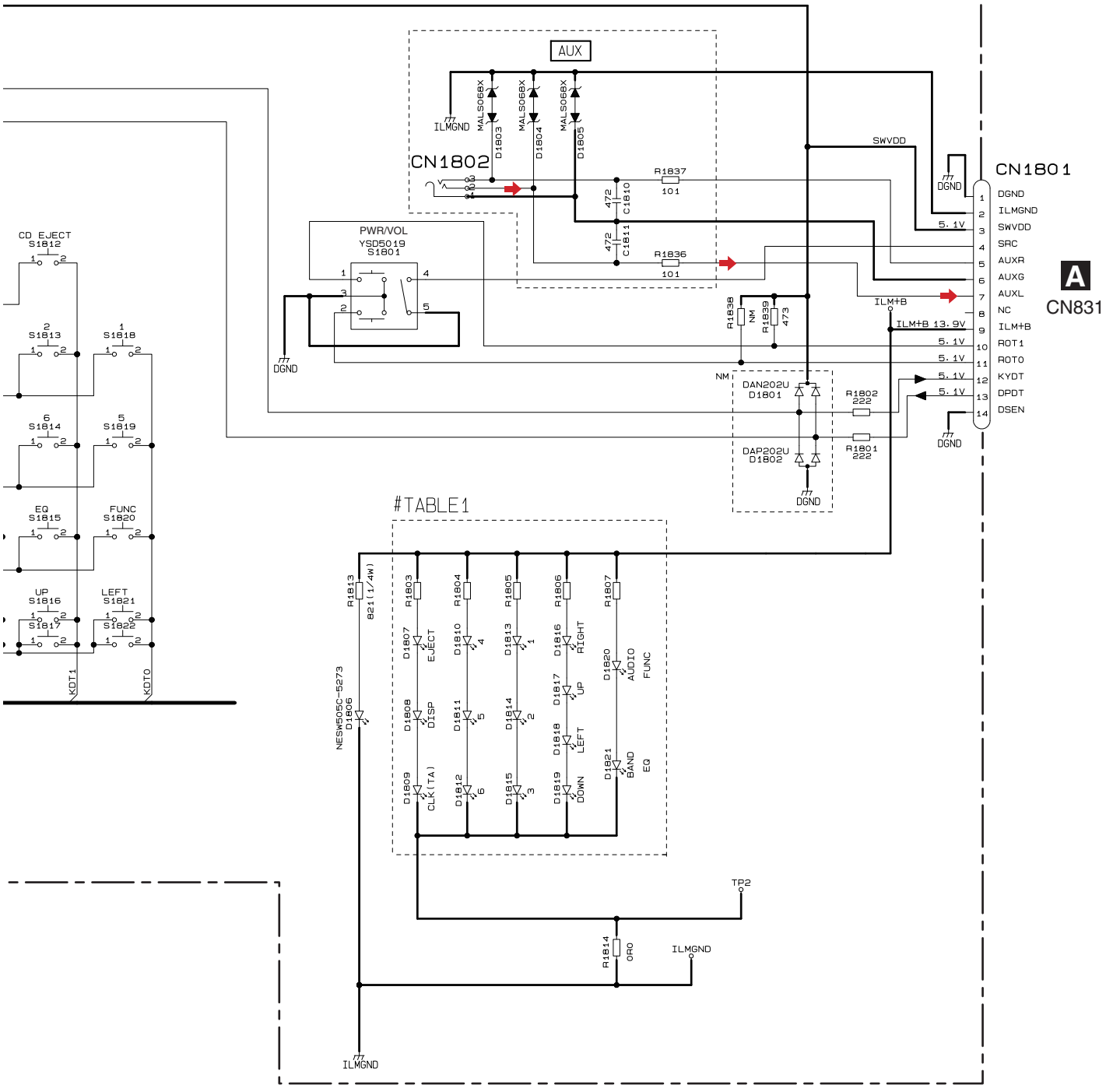
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

EVOL	151 - 200	SWVDD5	801 - 820	CD VD	991 - 999
MUTE	201 - 250	ILMPW	821 - 830		
AUX IN	251 - 260	GRILLE	831 - 850		
AMP	301 - 350	TELMUTE	851 - 870		
RCA	351 - 400	W. REM	871 - 880		
TUNER	401 - 600	B.UP	901 - 910		
UCOM	601 - 640	POWER	911 - 930		
ROM CLT	641 - 650	ASENSE	931 - 940		
CD MECHA	651 - 700	A.ANT B.REM	951 - 960		

10.2 KEYBOARD UNIT



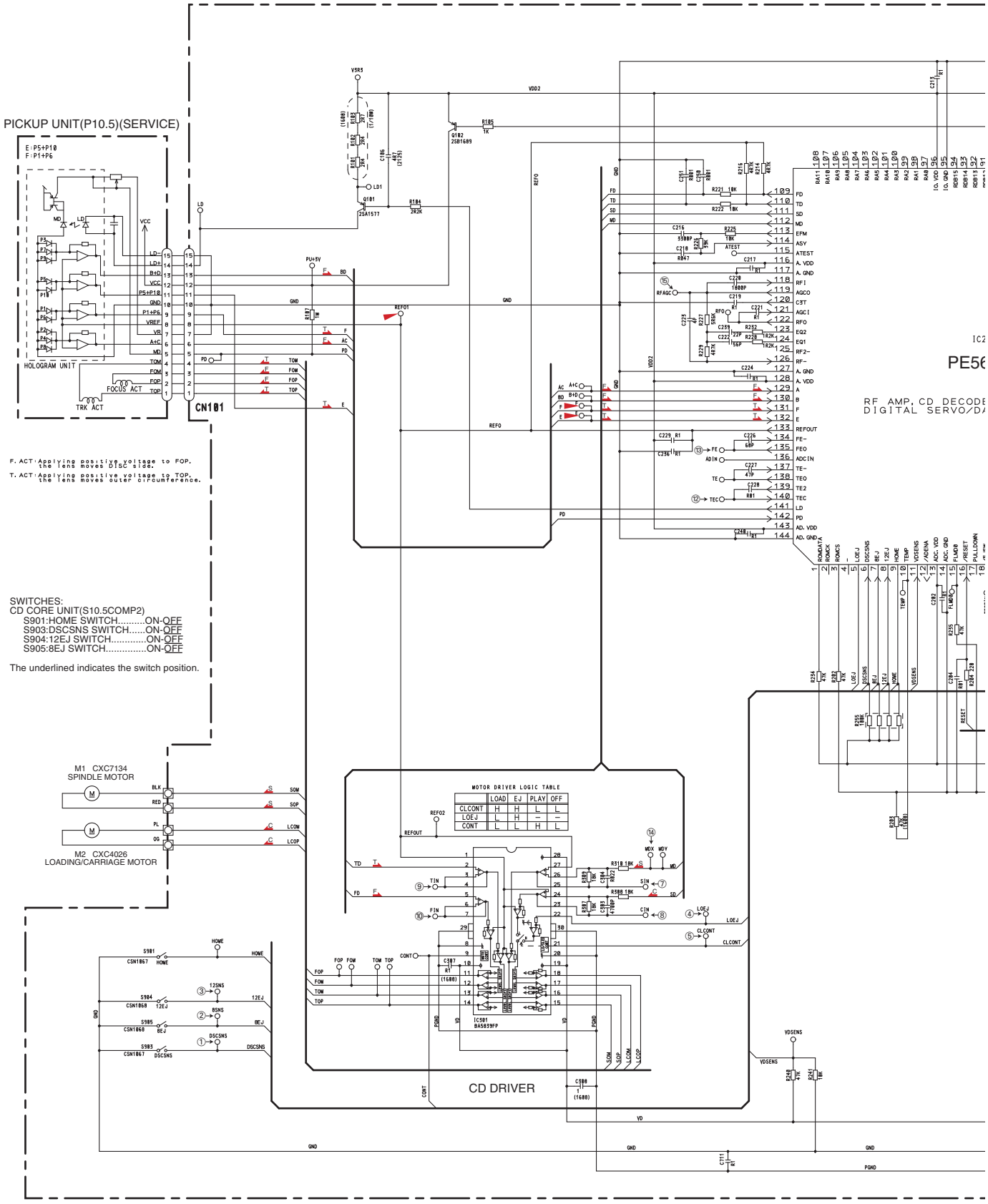
B KEYBOARD UNIT



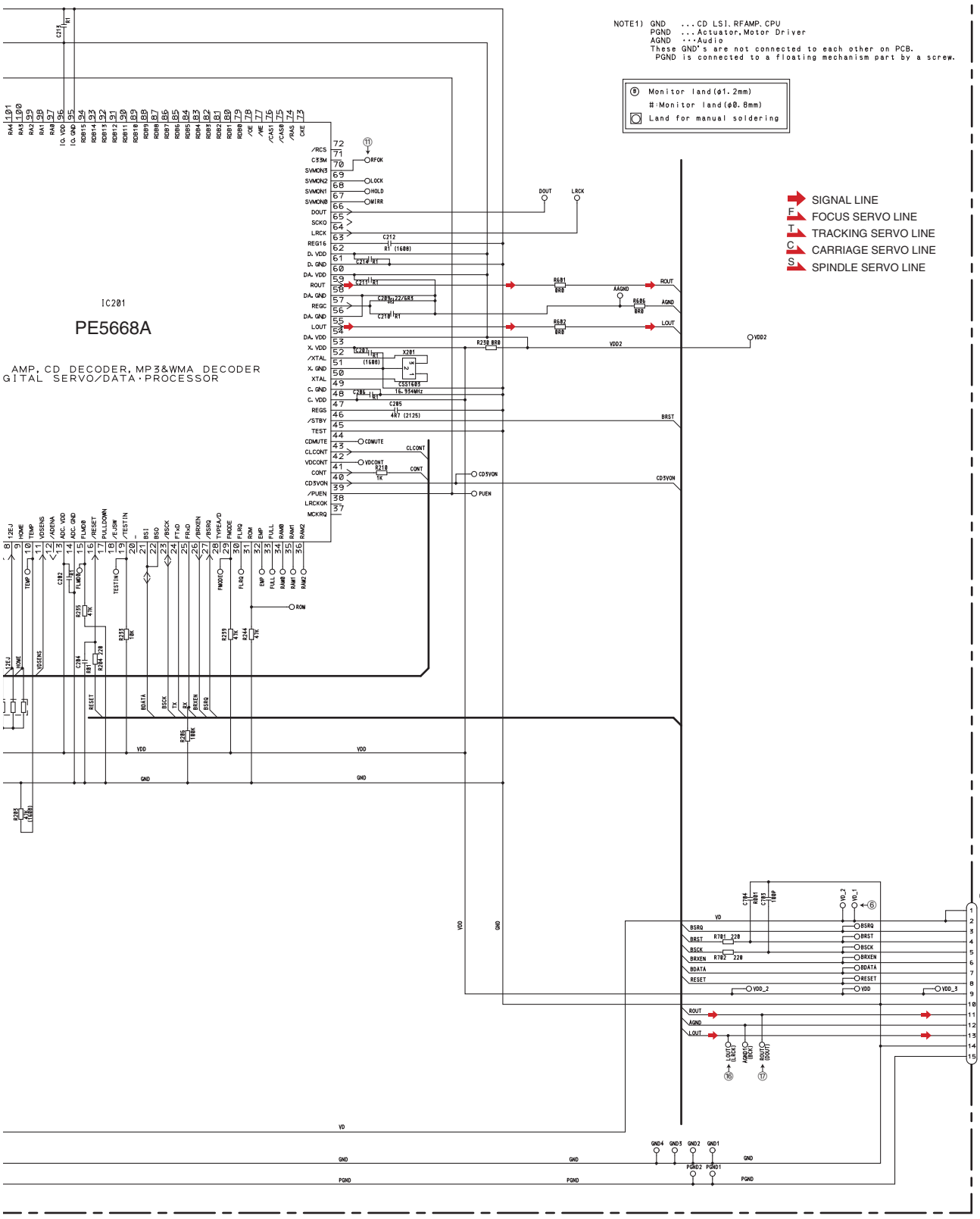
model	LED COLOR	R1803-R1805	R1806	R1807	D1807-D1821
A : DEH-1120MP/XN/EW5	PUER GREEN	561(1/4W)	391(1/4W)	751(1/4W)	CL-195PG-CD
B : DEH-1100MP/XN/EW5	SUPER RED	821(1/4W)	391(1/4W)	122(1/4W)	CL-195SR-CD
C : DEH-1100MPB/XN/EW5	SUPER RED	821(1/4W)	391(1/4W)	122(1/4W)	CL-195SR-CD

10.3 CD MECHANISM MODULE(GUIDE PAGE)

C-a



C CD CORE UNIT(S10.5COMP2)



C CD CORE UNIT(S10.5COMP2)

NOTE1) GND ...CD LSI, RFAMP, CPU
PGND ...Actuator, Motor Driver
AGND ...Audio
These GND's are not connected to each other on PCB.
PGND is connected to a floating mechanism part by a screw.

Ⓑ Monitor land(φ1.2mm)
#:Monitor land(φ0.8mm)
Land for manual soldering

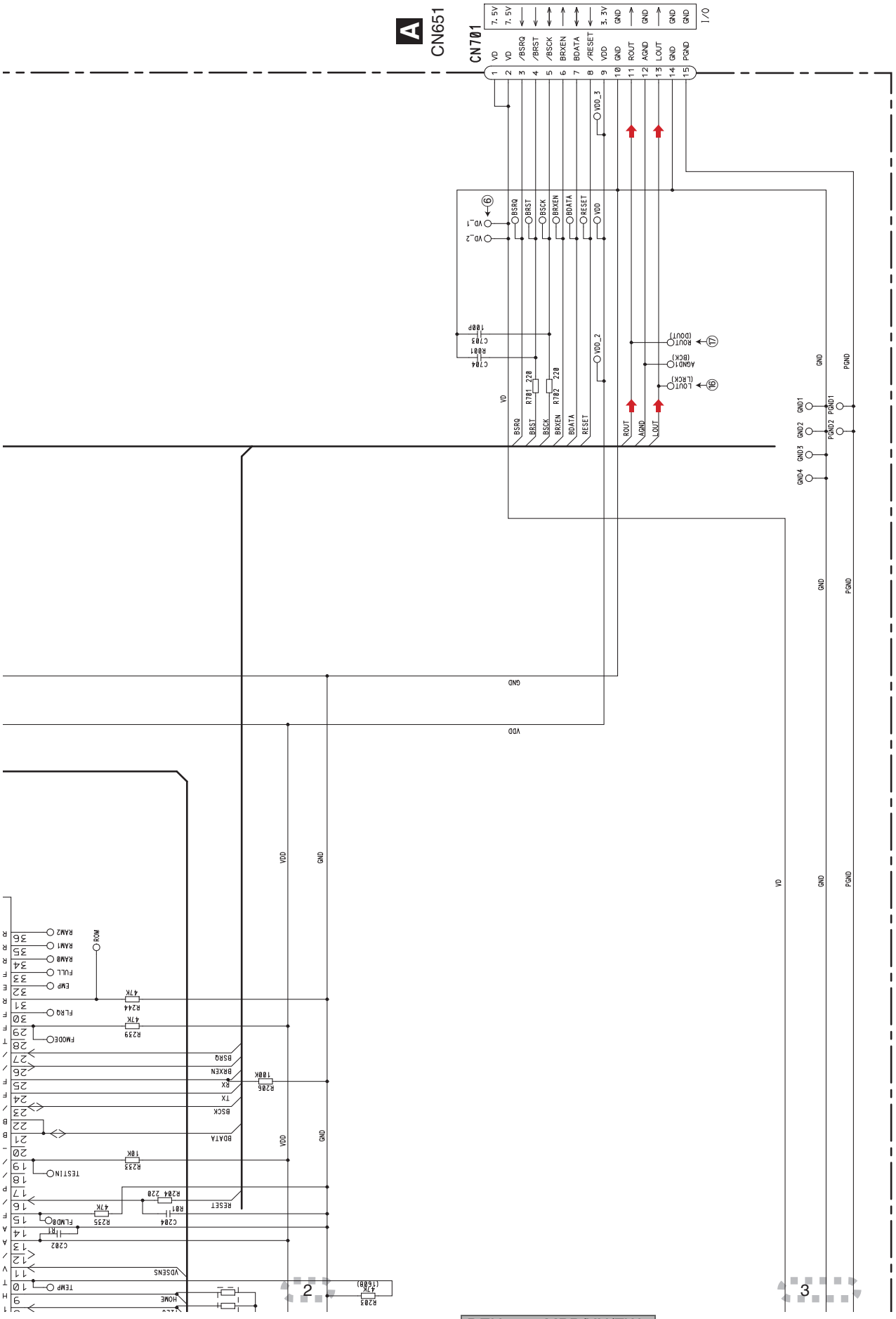
SIGNAL LINE
F FOCUS SERVO LINE
T TRACKING SERVO LINE
C CARRIAGE SERVO LINE
S SPINDLE SERVO LINE

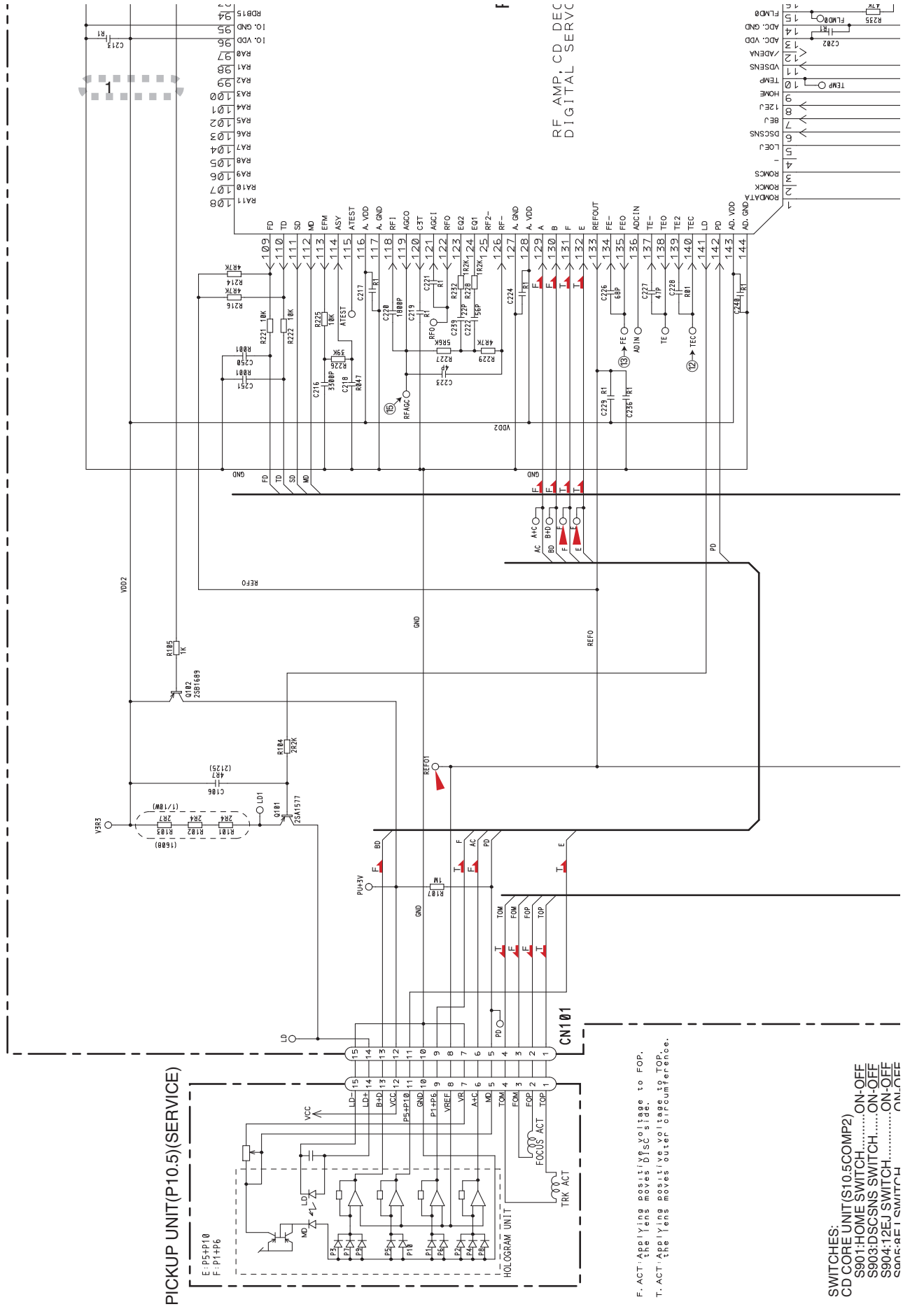
DEH-1100MPB/XN/EW5

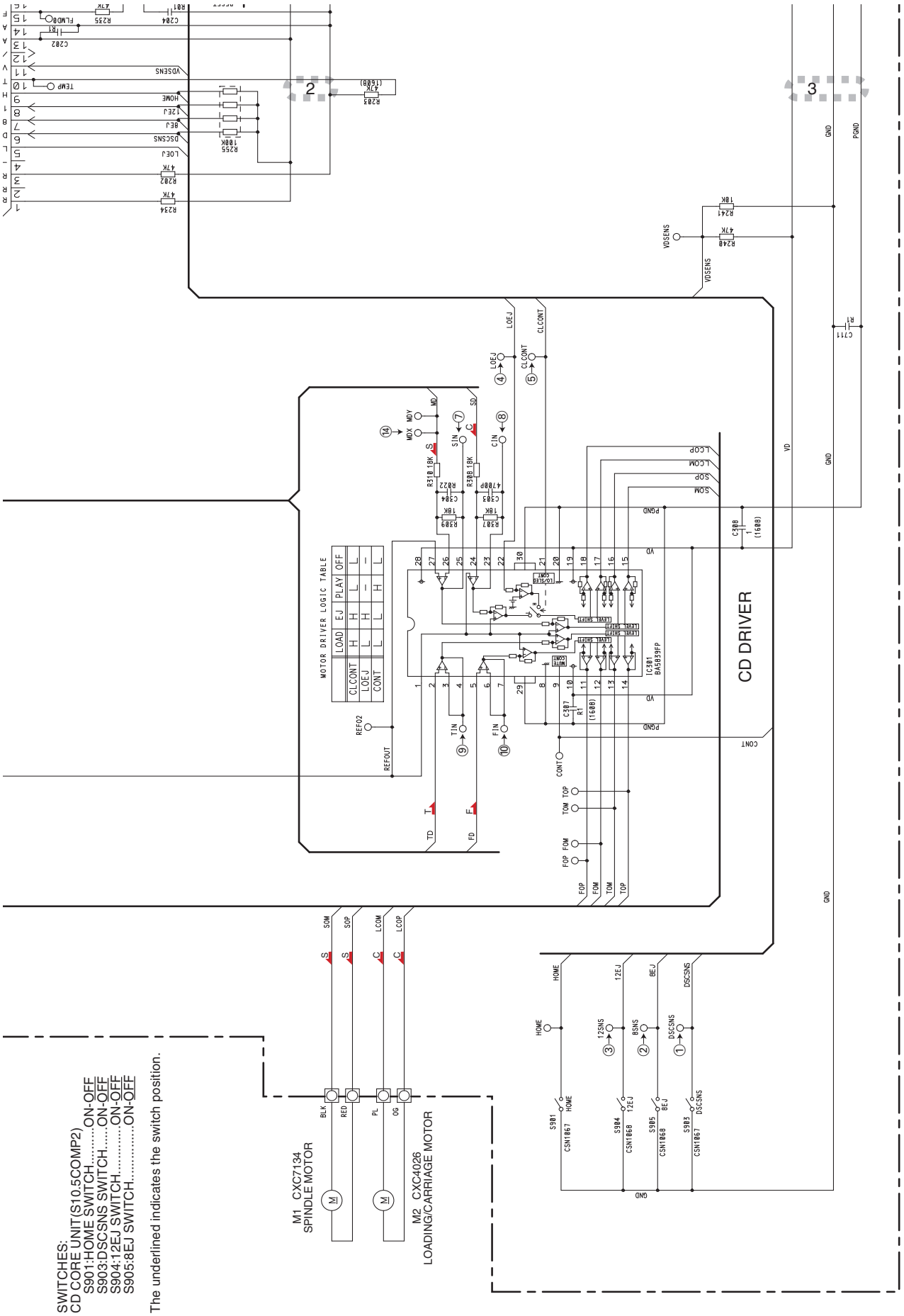
IC201

PE5668A

AMP, CD DECODER, MP3&WMA DECODER
ITAL SERVO/DATA·PROCESSOR


A
CN651
CN701
7.5V
7.5V
I/O
VD
VD
/BSRQ
/BRST
/BSCK
BRXEN
BDATA
/RESET
3.3V
GND
ROUT
AGND
LOUT
GND
GND
PGND
VDD_3
VD_1
VD_2
BSRQ
BRST
BSCK
BRXEN
BDATA
RESET
VDD
ROUT
AGND
LOUT
R701 220
R702 220
C703 100P
C704
R801
GND1
GND2
GND3
GND4
PGND1
PGND2
GND
PGND
VD
VDD
2
3
C-a C-b
C-b

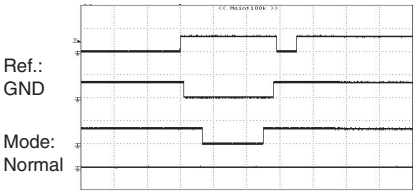
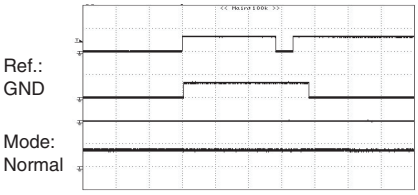
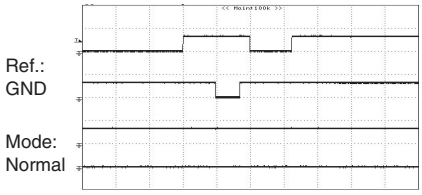
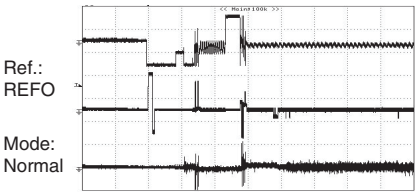
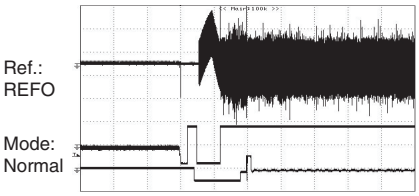
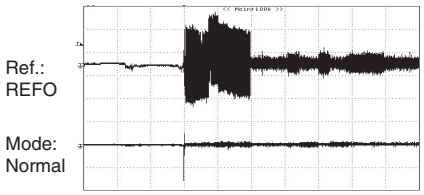
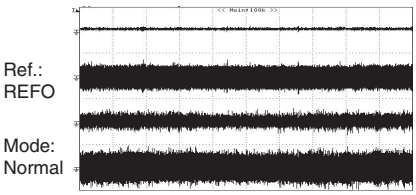
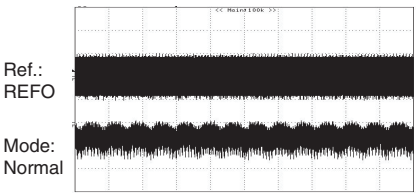
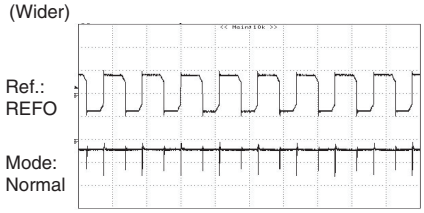
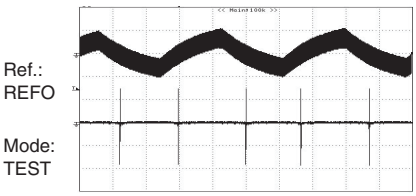
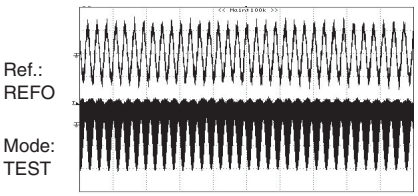
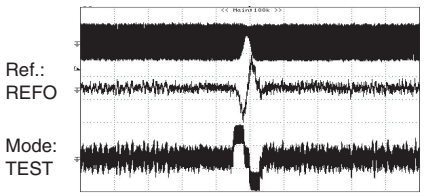

C-b
C-a
RF AMP, CD DEC
DIGITAL SERVO
PICKUP UNIT(P10.5)(SERVICE)
E: P5+P10
F: P1+P6
HOLOGRAM UNIT
CN101
SWITCHES:
CD CORE UNIT(S10.5COMP2)
S901:HOME SWITCH.....ON-OFF
S903:DSCSNS SWITCH.....ON-OFF
S904:12EJ SWITCH.....ON-OFF
F. ACT : Applying positive voltage to FOP.
the lens moves Disc side.
T. ACT : Applying positive voltage to TOP.
the lens moves outer circumference.
C-a C-b
C-a


C-b
C-a c-b
C-a
CD DRIVER
IC301 BA5859FP
MOTOR DRIVER LOGIC TABLE
LOAD CLCONT H
EJ LOEJ H
PLAY L H
OFF L L
M1 CXC7134 SPINDLE MOTOR
M2 CXC4026 LOADING/CARRIAGE MOTOR
SWITCHES:
CD CORE UNIT(S10.5COMP2)
S901:HOME SWITCH.....ON-OFF
S903:DSCSNS SWITCH.....ON-OFF
S904:12EJ SWITCH.....ON-OFF
S905:8EJ SWITCH.....ON-OFF
The underlined indicates the switch position.

10.4 WAVEFORMS

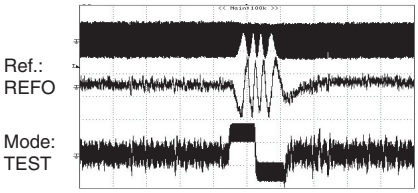
● CD CORE UNIT

Note : 1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage REFO1(1.65 V)

① DSCSNS 5 V/div 500 ms/div ② 8SNS 5 V/div ③ 12SNS 5 V/div ④ LOEJ 5 V/div 12 cm CD Loading operation  	① DSCSNS 5 V/div 500 ms/div ⑤ CLCONT 5 V/div ④ LOEJ 5 V/div ⑥ VD 10 V/div 12 cm CD Loading operation  	① DSCSNS 5 V/div 500 ms/div ② 8SNS 5 V/div ③ 12SNS 5 V/div ④ LOEJ 5 V/div 8 cm CD Loading operation 
⑦ SIN 1 V/div 1 s/div ⑧ CIN 500 mV/div ⑨ TIN 1 V/div 12 cm CD-DA setup operation after loading  	⑩ FIN 200 mV/div 500 ms/div ⑪ RFOK(MONI_2) 2 V/div ⑦ SIN 2 V/div 12 cm CD-DA Source On setup operation  	⑫ TE 500 mV/div 200 ms/div ⑬ FE 500 mV/div Source On setup operation 
⑬ FE 500 mV/div 20 ms/div ⑩ FIN 500 mV/div ⑫ TE 500 mV/div ⑨ TIN 500 mV/div CD-DA Play operation  	⑭ MDX 2 V/div 200 ms/div ⑦ SIN 500 mV/div Spindle waveform during play operation  	⑭ MDX 2 V/div 5 µs/div ⑦ SIN 500 mV/div Spindle waveform during play operation (Wider) 
⑩ FIN 500 mV/div 200 ms/div ⑬ FE 500 mV/div Focus Search waveform  	⑫ TE 500 mV/div 2 ms/div ⑮ RFAGC 500 mV/div Track Open waveform  	⑮ RFAGC 1 V/div 500 µs/div ⑫ TE 500 mV/div ⑨ TIN 500 mV/div 1 Track Jump waveform 

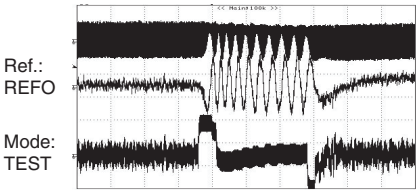
⑮ RFAGC	1 V/div	500 µs/div
⑫ TE	500 mV/div	
⑨ TIN	500 mV/div	

4 Tracks Jump waveform



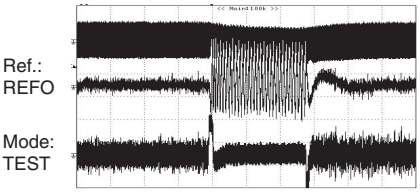
⑮ RFAGC	1 V/div	500 µs/div
⑫ TE	500 mV/div	
⑨ TIN	500 mV/div	

10 Tracks Jump waveform



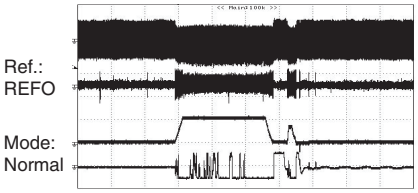
⑮ RFAGC	1 V/div	2 ms/div
⑫ TE	500 mV/div	
⑨ TIN	500 mV/div	

32 Tracks Jump waveform



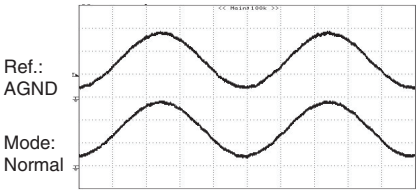
⑮ RFAGC	1 V/div	200 ms/div
⑫ TE	1 V/div	
⑧ CIN	1 V/div	
⑦ SIN	2 V/div	

Search operation(Outter to Inner)



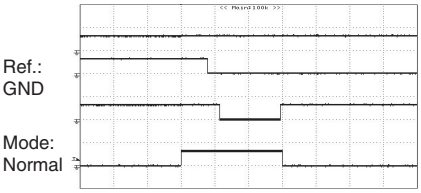
⑯ LOUT	1 V/div	200 µs/div
⑰ ROUT	1 V/div	

Analog audio waveform



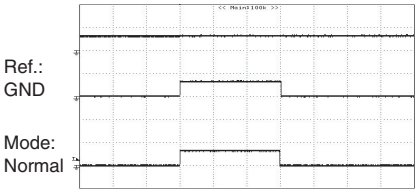
① DSCSNS	5 V/div	500 ms/div
② 8SNS	5 V/div	
③ 12SNS	5 V/div	
④ LOEJ	5 V/div	

12 cm CD Eject operation



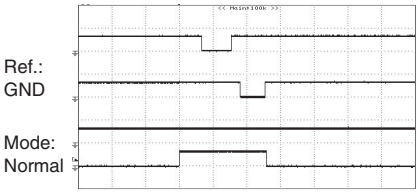
① DSCSNS	5 V/div	500 ms/div
⑤ CLCONT	5 V/div	
④ LOEJ	5 V/div	

12 cm CD Eject operation



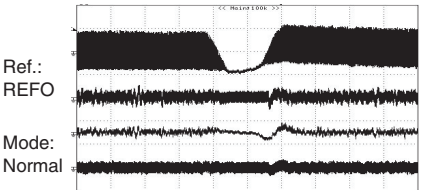
① DSCSNS	5 V/div	500 ms/div
② 8SNS	5 V/div	
③ 12SNS	5 V/div	
④ LOEJ	5 V/div	

8 cm CD Eject operation



⑮ RFAGC	1 V/div	500 µs/div
⑨ TIN	1 V/div	
⑫ TE	1 V/div	
⑩ FIN	1 V/div	

Black dot(800 µm) during play

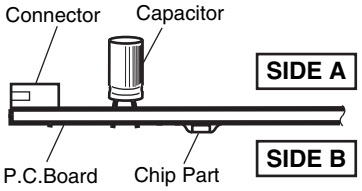


11. PCB CONNECTION DIAGRAM

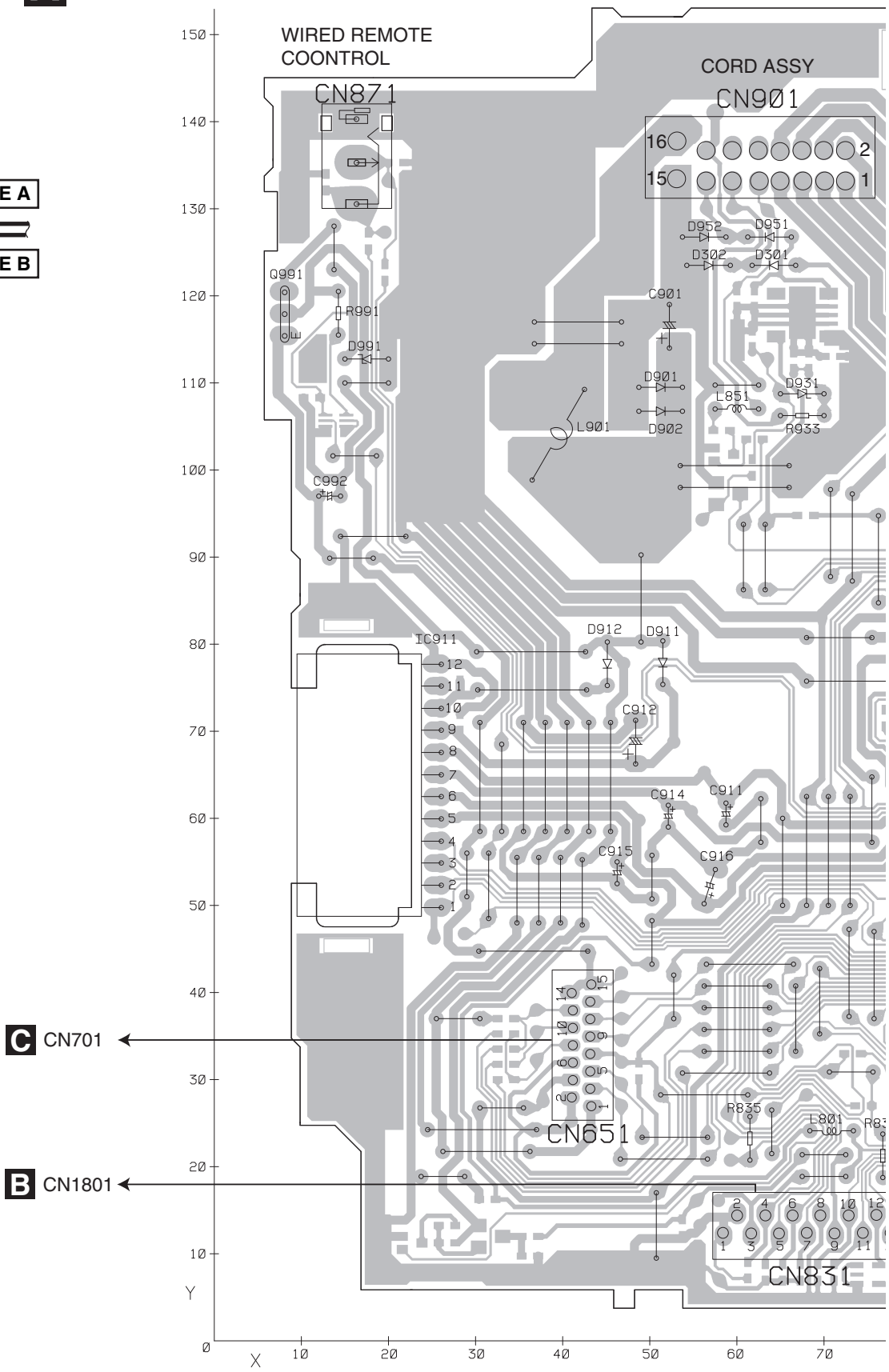
11.1 TUNER AMP UNIT

NOTE FOR PCB DIAGRAMS

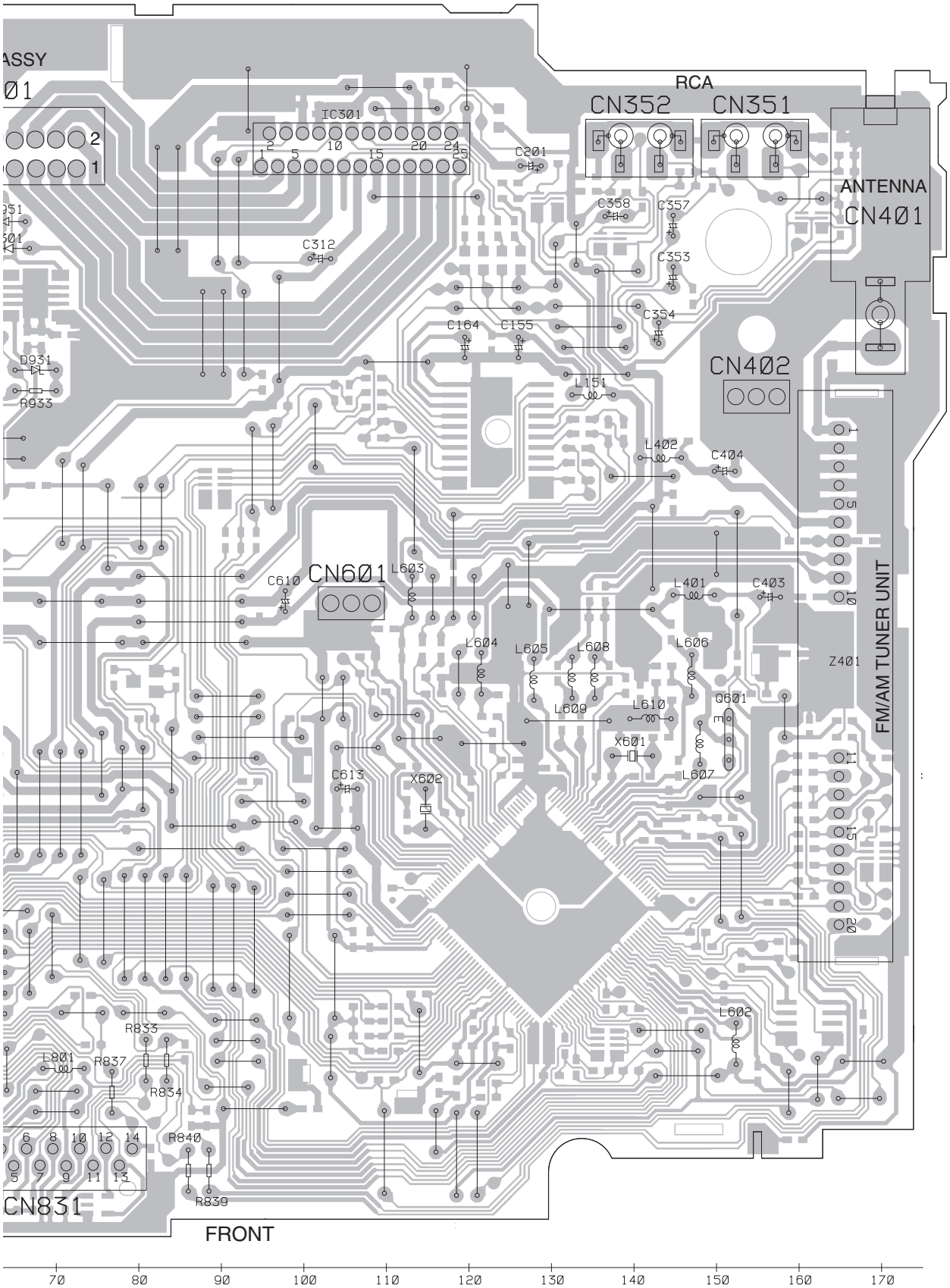
1. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams



A TUNER AMP UNIT



SIDE A


RCA
CN352
CN351
ANTENNA
CN401
CN402
CN601
CN831
IC301
C201
C358
C357
C353
C354
C312
C164
C155
L151
D931
R933
L402
C404
L603
C610
L401
C403
L604
L605
L608
L606
L609
L610
Q601
X601
L607
C613
X602
Z401
FM/AM TUNER UNIT
L602
R833
L801
R837
R834
R840
R839
FRONT
70 80 90 100 110 120 130 140 150 160 170

A

A

B

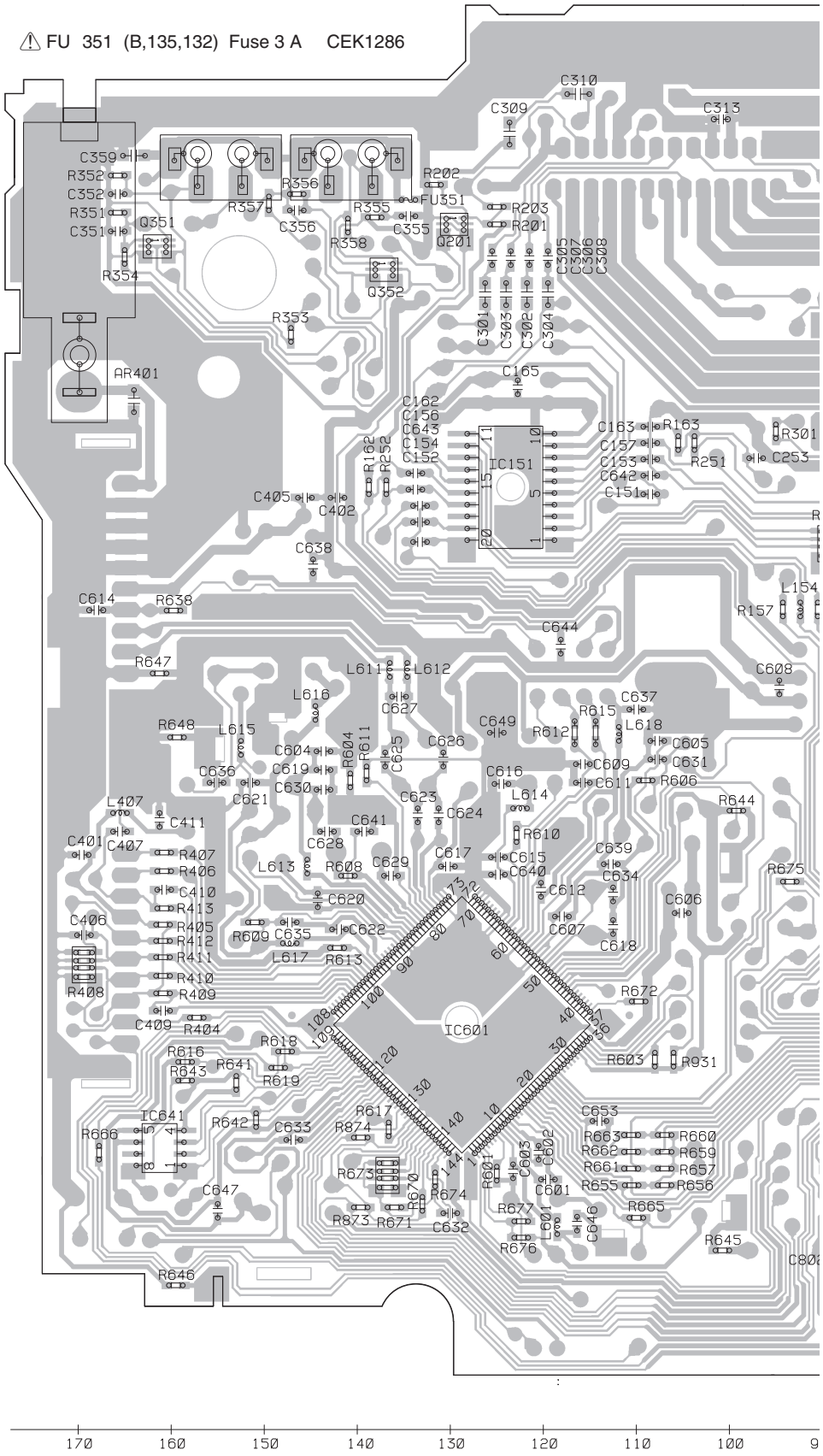
C

D

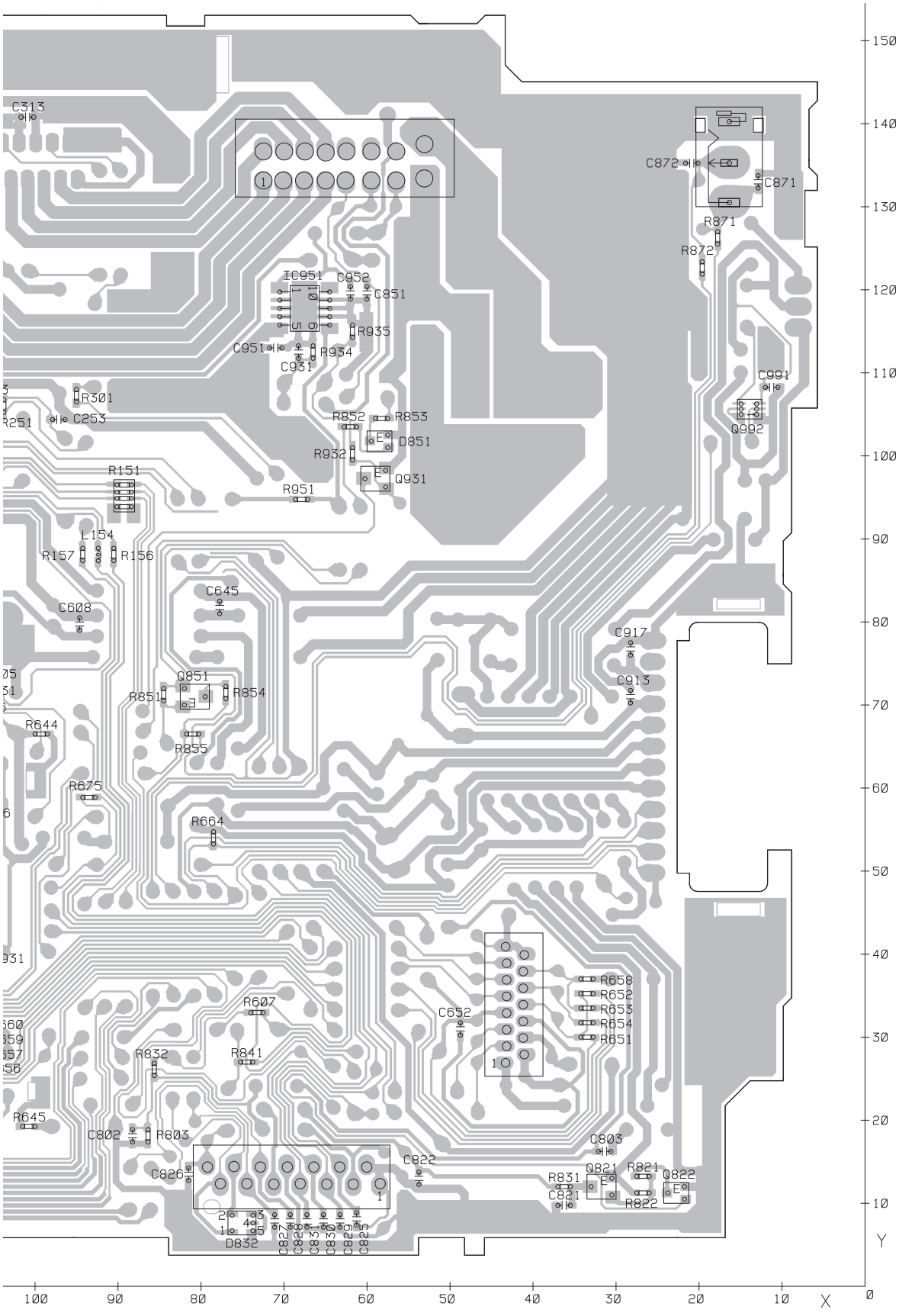
E

F

A TUNER AMP UNIT



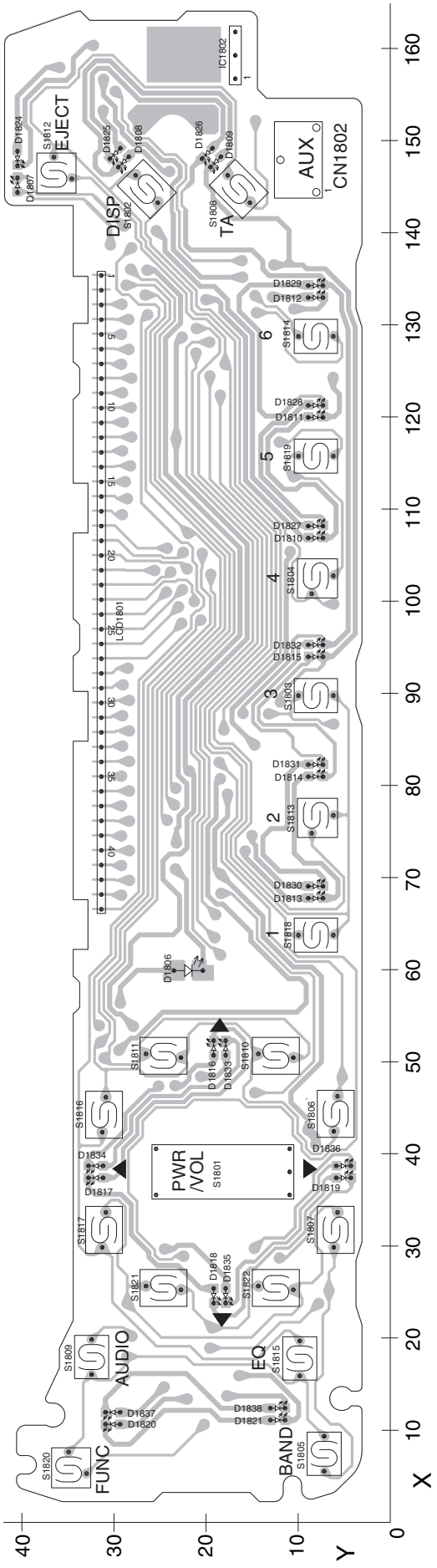
SIDE B


C313
C872
C871
R871
R872
IC951
C952
C851
R935
C951
R934
C931
C991
R301
C253
R852
R853
D851
R932
Q931
Q992
R151
R951
L154
R157
R156
C645
C608
C917
C913
Q851
R851
R854
R644
R855
R675
R664
R658
R652
R653
R654
R651
C652
R607
R832
R841
R645
C802
R803
C803
C822
C826
Q821
R821
Q822
R831
C821
R822
D832
C827
C828
C831
C830
C829
C825
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Y
100
90
80
70
60
50
40
30
20
10
X

11.2 KEYBOARD UNIT

B KEYBOARD UNIT

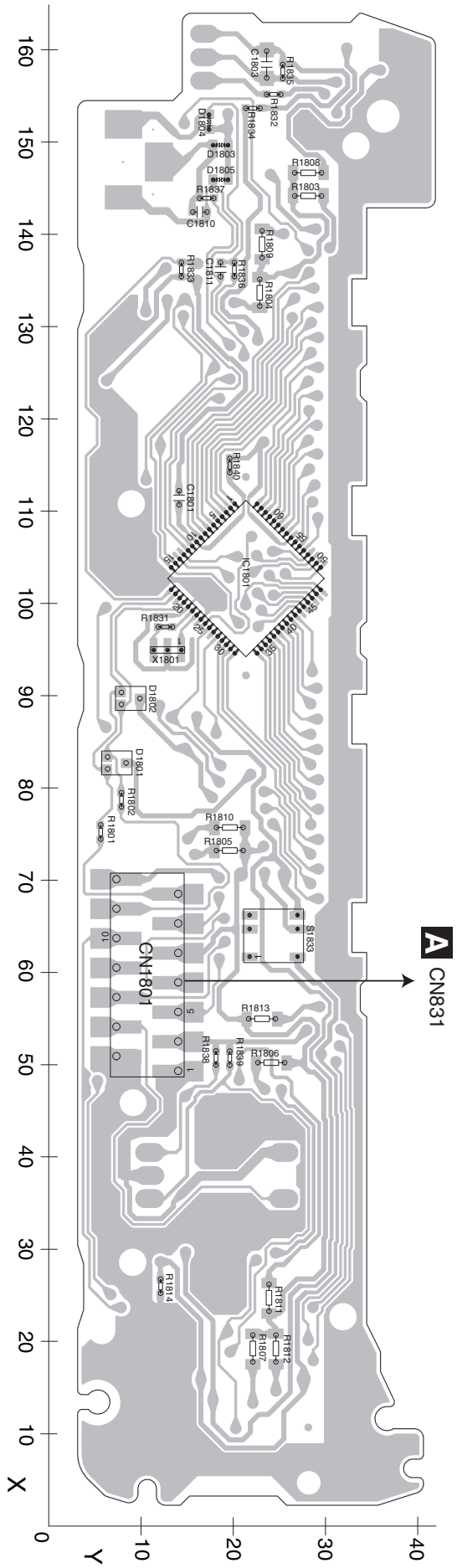
SIDE A



B

B KEYBOARD UNIT

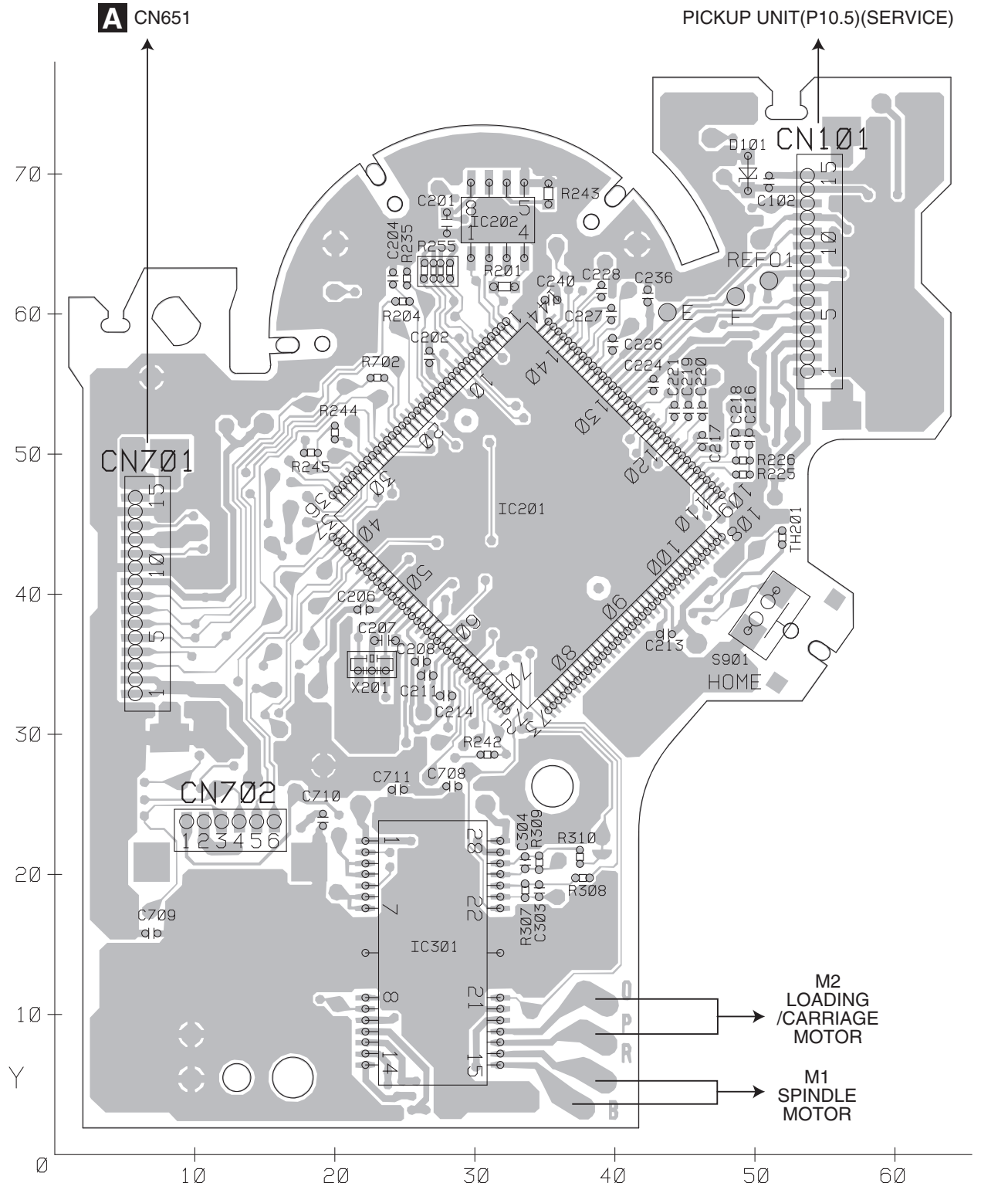
SIDE B



11.3 CD CORE UNIT(S10.5COMP2)

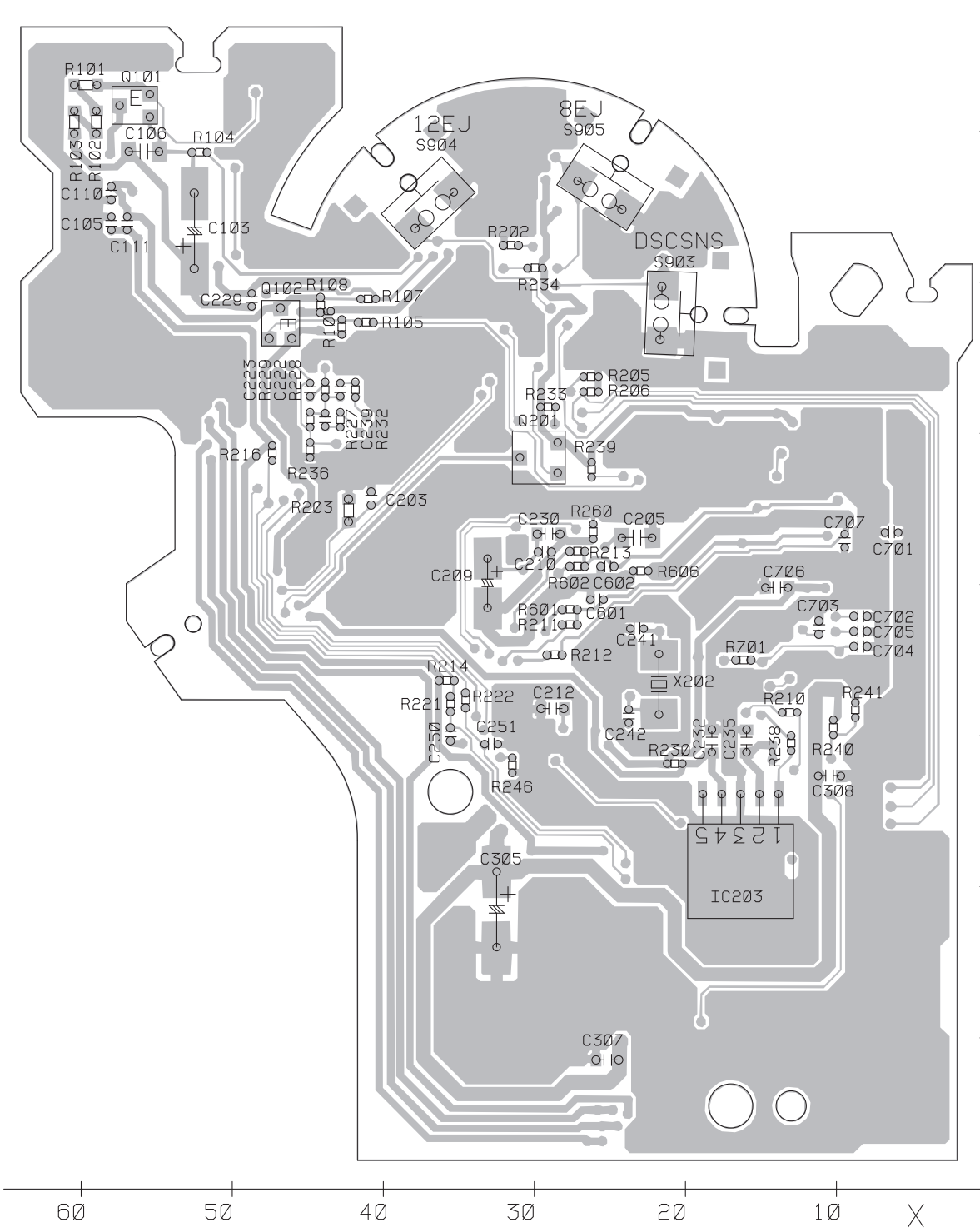
C CD CORE UNIT(S10.5COMP2)

SIDE A



C CD CORE UNIT(S10.5COMP2)

SIDE B



12. ELECTRICAL PARTS LIST

NOTE:

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

  Chip Resistor

  RS1/◯S◯◯◯J,RS1/◯◯S◯◯◯J

  Chip Capacitor (except for CQS.....)

  CKS....., CCS....., CSZS.....
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Meaning of the figures and others in the parentheses in the parts list.*

  Example) IC 301 is on the point (face A, 91 of x-axis, and 111 of y-axis) of the corresponding PC board.

  IC 301 (A, 91, 111) IC NJM2068V
- *The expression of the unit in this manual is shown by u instead of µ. Please do not make a mistake.*

Unit Number : QWM3032

Unit Name : Tuner Amp Unit

Unit Number : (1120MP)

Unit Name : Keyboard Unit

Unit Number : (1100MP)

Unit Number : (1100MPB)

Unit Name : Keyboard Unit

Unit Number : CWX3514

Unit Name : CD Core Unit(S10.5COMP2)

A

Unit Number : QWM3032

Unit Name : Tuner Amp Unit

MISCELLANEOUS

Circuit Symbol and No.		Part No.
IC 151	(B,124,101) IC	PML014A
IC 301	(A,95,133) IC	PAL007C
IC 601	(B,129,44) IC	PN5016A
IC 911	(A,24,80) IC	BA49181-V12
Q 201	(B,130,130) Transistor	UMD2N
Q 351	(B,162,127) Transistor	RT3N66M
Q 601	(A,152,67) Transistor	2SD1858
Q 821	(B,32,12) Transistor	2SA1036K
Q 822	(B,23,11) Transistor	LTC114EUB
Q 851	(B,81,71) Transistor	2SA1036K
Q 931	(B,59,97) Transistor	2SC2412K
Q 991	(A,8,115) Transistor	2SD2396
Q 992	(B,14,106) Transistor	UMD2N
D 301	(A,67,124) Diode	1SR139-400
D 302	(A,54,124) Diode	1SR139-400
D 832	(B,75,8) Diode	FTZ6R8E
D 851	(B,59,102) Diode	DAN202U
D 901	(A,49,110) Diode	1SR139-400
D 902	(A,49,107) Diode	1SR139-400
D 911	(A,52,80) Diode	1SR139-400
D 912	(A,45,80) Diode	1SR139-400
D 931	(A,65,109) Diode	HZS7L(A1)
D 991	(A,20,113) Diode	HZS7L(C3)
L 151	(A,138,106) Inductor	LAU2R2K
L 401	(A,150,82) Inductor	LAU2R2K
L 402	(A,146,98) Inductor	LAU2R2K
L 407	(B,166,66) Inductor	CTF1473
L 601	(B,119,22) Inductor	CTF1389
L 602	(A,152,25) Inductor	LAUR47K
L 603	(A,113,79) Inductor	LAU2R2K
L 604	(A,122,70) Inductor	LAUR47K
L 605	(A,128,69) Inductor	LAUR47K
L 606	(A,147,69) Inductor	LAU1R0K
L 607	(A,148,61) Inductor	LAU1R0K
L 608	(A,135,69) Inductor	LAU1R5K
L 609	(A,133,69) Inductor	LAU1R5K
L 610	(A,140,67) Inductor	LAU1R2J
L 611	(B,137,82) Inductor	CTF1379
L 612	(B,135,82) Inductor	CTF1379
L 613	(B,145,61) Inductor	CTF1379
L 614	(B,123,67) Inductor	CTF1379
L 615	(B,153,73) Inductor	CTF1379
L 616	(B,145,77) Inductor	CTF1379
L 617	(B,147,52) Inductor	CTF1389
L 801	(A,73,24) Inductor	LAU2R2K
L 851	(A,58,107) Inductor	LAU2R2K
L 901	(A,36,98) Choke Coil 600 uH	CTH1280
X 601	(A,142,62) Oscillator 74.100 MHz	CSS1749
⚠FU351	(B,135,132) Fuse 3 A	CEK1286
AR401	(B,164,111) Surge Protector	IMSA-6801-01Y901

RESISTORS

Circuit Symbol and No.		Part No.
R 151	(B,89,95)	RAB4C102J
R 156	(B,91,88)	RS1/16S681J
R 157	(B,94,88)	RS1/16S681J
R 162	(B,139,101)	RS1/16S102J
R 163	(B,106,106)	RS1/16S102J

Circuit Symbol and No.		Part No.
R 201	(B,125,130)	RS1/16S103J
R 202	(B,132,134)	RS1/16S153J
R 203	(B,125,131)	RS1/16S221J
R 251	(B,104,106)	RS1/16S223J
R 252	(B,137,101)	RS1/16S223J
R 301	(B,95,107)	RS1/16S153J
R 351	(B,166,131)	RS1/16S223J
R 352	(B,166,135)	RS1/16S223J
R 353	(B,147,118)	RS1/16S821J
R 354	(B,165,126)	RS1/16S821J
R 404	(B,157,44)	RS1/16S102J
R 405	(B,161,54)	RS1/16S102J
R 406	(B,161,60)	RS1/16S102J
R 407	(B,161,62)	RS1/16S102J
R 408	(B,169,50)	RAB4C104J
R 409	(B,161,47)	RS1/16S391J
R 410	(B,161,49)	RS1/16S681J
R 411	(B,161,51)	RS1/16S681J
R 412	(B,161,53)	RS1/16S681J
R 413	(B,161,56)	RS1/16S472J
R 601	(B,125,28)	RS1/16S473J
R 603	(B,108,40)	RS1/16S473J
R 606	(B,109,70)	RS1/16S473J
R 608	(B,141,60)	RS1/16S470J
R 610	(B,123,64)	RS1/16S203J
R 611	(B,139,71)	RS1/16S182J
R 612	(B,117,75)	RS1/16S563J
R 613	(B,142,52)	RS1/16S302J
R 615	(B,114,75)	RS1/16S563J
R 616	(B,159,40)	RS1/16S104J
R 617	(B,137,32)	RS1/16S473J
R 618	(B,148,41)	RS1/16S473J
R 619	(B,149,39)	RS1/16S104J
R 638	(B,160,88)	RS1/16S273J
R 643	(B,159,38)	RS1/16S104J
R 644	(B,99,67)	RS1/16S0R0J
R 645	(B,101,19)	RS1/16S0R0J
R 646	(B,160,16)	RS1/16S0R0J
R 648	(B,159,74)	RS1/16S0R0J
R 651	(B,34,30)	RS1/16S104J
R 652	(B,34,35)	RS1/16S102J
R 653	(B,34,34)	RS1/16S102J
R 654	(B,34,32)	RS1/16S221J
R 656	(B,107,26)	RS1/16S104J
R 657	(B,107,28)	RS1/16S104J
R 658	(B,34,37)	RS1/16S104J
R 659	(B,107,30)	RS1/16S472J
R 660	(B,107,32)	RS1/16S472J
R 661	(B,111,28)	RS1/16S221J
R 662	(B,111,30)	RS1/16S221J
R 663	(B,111,32)	RS1/16S221J
R 664	(B,79,54)	RS1/16S473J
R 666	(B,168,30)	RS1/16S103J
R 671	(B,136,24)	RS1/16S473J
R 672	(B,110,46)	RS1/16S104J
R 673	(B,137,27)	RAB4C104J
R 674	(B,132,27)	RS1/16S104J
R 675	(B,94,59)	RS1/16S473J
R 803	(B,86,18)	RS1/16S222J
R 821	(B,27,13)	RS1/16S562J

Circuit Symbol and No.		Part No.
R 822	(B,27,11)	RS1/16S103J
R 831	(B,36,12)	RS1/16S1R0J
R 832	(B,86,26)	RS1/16S473J
R 833	(A,81,23)	RD1/4PU222J
R 834	(A,83,23)	RD1/4PU222J
R 835	(A,62,21)	RD1/4PU222J
R 837	(A,77,19)	RD1/4PU103J
R 839	(A,89,14)	RD1/4PU222J
R 840	(A,86,14)	RD1/4PU222J
R 841	(B,75,27)	RS1/16S104J
R 851	(B,85,71)	RS1/16S223J
R 852	(B,62,104)	RS1/16S472J
R 853	(B,58,105)	RS1/16S153J
R 854	(B,77,72)	RS1/16S102J
R 855	(B,81,67)	RS1/16S104J
R 871	(B,18,126)	RS1/16S102J
R 872	(B,20,123)	RS1/16S102J
R 873	(B,140,24)	RS1/16S103J
R 874	(B,140,31)	RS1/16S103J
R 931	(B,106,40)	RS1/16S104J
R 932	(B,62,100)	RS1/16S223J
R 933	(A,70,106)	RD1/4PU102J
R 934	(B,67,113)	RS1/16S473J
R 935	(B,62,115)	RS1/16S473J
R 991	(A,14,116)	RD1/4PU271J

CAPACITORS

C 151	(B,109,101)	CKSRYB224K10
C 152	(B,133,95)	CKSRYB224K10
C 153	(B,109,104)	CKSRYB105K10
C 154	(B,133,98)	CKSRYB105K10
C 155	(A,126,113)	CEJQ470M10
C 156	(B,134,101)	CKSRYB105K10
C 157	(B,109,106)	CKSRYB105K10
C 162	(B,134,103)	CKSRYB105K10
C 163	(B,109,108)	CKSRYB105K10
C 164	(A,120,113)	CEJQ100M16
C 165	(B,123,112)	CKSRYB104K16
C 201	(A,129,134)	CEJQ330M10
C 253	(B,97,104)	CKSRYB104K16
C 301	(B,126,122)	CKSQYB474K16
C 302	(B,122,122)	CKSQYB474K16
C 303	(B,124,122)	CKSQYB474K16
C 304	(B,120,122)	CKSQYB474K16
C 305	(B,126,126)	CKSRYB474K10
C 306	(B,122,126)	CKSRYB474K10
C 307	(B,124,126)	CKSRYB474K10
C 308	(B,120,126)	CKSRYB474K10
C 309	(B,124,139)	CKSQYB225K10
C 310	(B,116,144)	CKSQYB225K10
C 312	(A,101,122)	CEJQ100M16
C 313	(B,101,141)	CKSRYB104K16
C 353	(A,145,119)	CEJQ2R2M50
C 354	(A,143,112)	CEJQ2R2M50
C 359	(B,164,137)	CCSQCH471J50
C 402	(B,142,100)	CKSRYB103K50
C 404	(A,150,97)	CEJQ101M10
C 405	(B,146,100)	CKSRYB103K50
C 406	(B,169,53)	CCSRCH390J50
C 409	(B,161,45)	CCSRCH100D50

Circuit Symbol and No.			Part No.
C 601	(B,120,27)		CKSRYB105K10
C 602	(B,121,30)		CKSRYB103K50
C 603	(B,123,28)		CKSRYB103K50
C 605	(B,108,74)		CKSRYB104K16
C 606	(B,105,56)		CKSRYB103K50
C 607	(B,118,55)		CKSRYB103K50
C 608	(B,95,80)		CKSRYB103K50
C 609	(B,116,72)		CKSRYB331K50
C 610	(A,98,80)		CEJQ101M6R3
C 611	(B,116,70)		CKSRYB331K50
C 612	(B,120,58)		CKSRYB103K50
C 613	(A,104,58)		CEAL101M6R3
C 614	(B,168,88)		CKSRYB102K50
C 615	(B,125,62)		CKSRYB331K50
C 616	(B,125,69)		CKSRYB105K10
C 617	(B,130,61)		CKSRYB105K10
C 619	(B,144,71)		CKSRYB103K50
C 620	(B,144,57)		CKSRYB105K10
C 621	(B,152,70)		CKSRYB103K50
C 622	(B,142,54)		CKSRYB104K16
C 623	(B,134,66)		CKSRYB102K50
C 624	(B,131,66)		CKSRYB102K50
C 625	(B,137,72)		CCSRCH270J50
C 626	(B,131,72)		CCSRCH270J50
C 627	(B,136,79)		CCSRCH150J50
C 628	(B,143,64)		CKSRYB102K50
C 629	(B,136,60)		CCSRCH4R0C50
C 630	(B,144,69)		CCSRCH8R0D50
C 631	(B,108,72)		CKSRYB223K50
C 632	(B,130,23)		CKSRYB104K16
C 633	(B,147,31)		CKSRYB104K16
C 635	(B,147,55)		CKSRYB104K16
C 637	(B,110,77)		CKSRYB103K50
C 640	(B,125,60)		CKSRYB104K16
C 642	(B,109,103)		CKSRYB122K50
C 643	(B,133,99)		CKSRYB122K50
C 646	(B,116,22)		CKSRYB103K50
C 652	(B,49,31)		CKSRYB103K50
C 653	(B,114,33)		CCSRCH220J50
C 821	(B,36,10)		CKSRYB104K16
C 825	(B,61,8)		CCSRCH221J50
C 826	(B,82,14)		CCSRCH221J50
C 827	(B,71,8)		CCSRCH221J50
C 828	(B,69,8)		CCSRCH221J50
C 829	(B,63,8)		CCSRCH221J50
C 830	(B,65,8)		CKSRYB104K16
C 831	(B,67,8)		CCSRCH221J50
C 871	(B,13,133)		CKSRYB103K50
C 872	(B,21,135)		CKSRYB103K50
C 901	(A,52,114)	3 300 uF/16 V	CCH1732
C 911	(A,59,62)		CEJQ100M16
C 912	(A,48,66)		CEAT102M16
C 913	(B,28,71)		CKSRYB104K16
C 914	(A,52,62)		CEAT221M10
C 915	(A,46,55)		CEJQ100M16
C 917	(B,28,77)		CKSRYB104K16
C 991	(B,11,108)		CKSRYB473K25
C 992	(A,12,97)		CEJQ101M10

B

Unit Number : (1120MP)
Unit Name : Keyboard Unit

MISCELLANEOUS

IC 1801	(B,103,21)	IC	PD6340A
D 1803	(B,150,19)	Diode	MALS068X
D 1804	(B,152,17)	Diode	MALS068X
D 1805	(B,146,19)	Diode	MALS068X
D 1806	(A,60,22)	White LED	NESW505C-5273
D 1807	(A,145,40)	LED	CL-195PG-CD
D 1808	(A,148,29)	LED	CL-195PG-CD
D 1809	(A,148,19)	LED	CL-195PG-CD
D 1810	(A,107,8)	LED	CL-195PG-CD
D 1811	(A,120,8)	LED	CL-195PG-CD
D 1812	(A,133,8)	LED	CL-195PG-CD
D 1813	(A,68,8)	LED	CL-195PG-CD
D 1814	(A,81,8)	LED	CL-195PG-CD
D 1815	(A,94,8)	LED	CL-195PG-CD
D 1816	(A,52,19)	LED	CL-195PG-CD
D 1817	(A,37,32)	LED	CL-195PG-CD
D 1818	(A,25,19)	LED	CL-195PG-CD
D 1819	(A,37,5)	LED	CL-195PG-CD
D 1820	(A,11,30)	LED	CL-195PG-CD
D 1821	(A,11,12)	LED	CL-195PG-CD
X 1801	(B,95,13)	Ceramic Resonator 5.00 MHz	CSS1731
S 1801	(A,38,18)	Rotary Switch(PWR/VOL)	YSD5019
LCD1801	(A,135,31)	LCD	CAW1927

RESISTORS

R 1801	(B,75,6)	RS1/16S222J
R 1802	(B,79,8)	RS1/16S222J
R 1803	(B,144,28)	RS1/4SA561J
R 1804	(B,134,23)	RS1/4SA561J
R 1805	(B,73,20)	RS1/4SA561J
R 1806	(B,50,24)	RS1/4SA391J
R 1807	(B,19,22)	RS1/4SA751J
R 1813	(B,55,23)	RS1/4SA821J
R 1814	(B,26,12)	RS1/16S0R0J
R 1833	(B,136,14)	RS1/16S473J
R 1836	(B,136,20)	RS1/16S101J
R 1837	(B,144,17)	RS1/16S101J
R 1839	(B,51,20)	RS1/16S473J

CAPACITORS

C 1801	(B,112,14)	CKSRYB105K10
C 1810	(B,143,16)	CKSRYB472K50
C 1811	(B,136,19)	CKSRYB472K50

B

Unit Number : (1100MP)
Unit Number : (1100MPB)
Unit Name : Keyboard Unit

MISCELLANEOUS

IC 1801	(B,103,21)	IC	PD6340A
D 1803	(B,150,19)	Diode	MALS068X

Circuit Symbol and No.			Part No.
D 1804	(B,152,17)	Diode	MALS068X
D 1805	(B,146,19)	Diode	MALS068X
D 1806	(A,60,22)	White LED	NESW505C-5273
D 1807	(A,145,40)	LED	CL-195SR-CD
D 1808	(A,148,29)	LED	CL-195SR-CD
D 1809	(A,148,19)	LED	CL-195SR-CD
D 1810	(A,107,8)	LED	CL-195SR-CD
D 1811	(A,120,8)	LED	CL-195SR-CD
D 1812	(A,133,8)	LED	CL-195SR-CD
D 1813	(A,68,8)	LED	CL-195SR-CD
D 1814	(A,81,8)	LED	CL-195SR-CD
D 1815	(A,94,8)	LED	CL-195SR-CD
D 1816	(A,52,19)	LED	CL-195SR-CD
D 1817	(A,37,32)	LED	CL-195SR-CD
D 1818	(A,25,19)	LED	CL-195SR-CD
D 1819	(A,37,5)	LED	CL-195SR-CD
D 1820	(A,11,30)	LED	CL-195SR-CD
D 1821	(A,11,12)	LED	CL-195SR-CD
X 1801	(B,95,13)	Ceramic Resonator 5.00 MHz	CSS1731
S 1801	(A,38,18)	Rotary Switch(PWR/VOL)	YSD5019
LCD1801	(A,135,31)	LCD(1100MP)	CAW1927
	(A,135,31)	LCD(1100MPB)	CAW1932

RESISTORS

R 1801	(B,75,6)	RS1/16S222J
R 1802	(B,79,8)	RS1/16S222J
R 1803	(B,144,28)	RS1/4SA821J
R 1804	(B,134,23)	RS1/4SA821J
R 1805	(B,73,20)	RS1/4SA821J
R 1806	(B,50,24)	RS1/4SA391J
R 1807	(B,19,22)	RS1/4SA122J
R 1813	(B,55,23)	RS1/4SA821J
R 1814	(B,26,12)	RS1/16S0R0J
R 1833	(B,136,14)	RS1/16S473J
R 1836	(B,136,20)	RS1/16S101J
R 1837	(B,144,17)	RS1/16S101J
R 1839	(B,51,20)	RS1/16S473J

CAPACITORS

C 1801	(B,112,14)	CKSRYB105K10
C 1810	(B,143,16)	CKSRYB472K50
C 1811	(B,136,19)	CKSRYB472K50

C

Unit Number : CWX3514
Unit Name : CD Core Unit(S10.5COMP2)

MISCELLANEOUS

IC 201	(A,34,46)	IC	PE5668A
IC 301	(A,27,14)	IC	BA5839FP
Q 101	(B,56,72)	Transistor	2SA1577
Q 102	(B,47,57)	Chip Transistor	2SB1689
X 201	(A,23,35)	Ceramic Resonator 16.934 MHz	CSS1603
S 901	(A,53,37)	Switch(HOME)	CSN1067
S 903	(B,19,58)	Switch(DSCSNS)	CSN1067
S 904	(B,38,67)	Switch(12EJ)	CSN1068
S 905	(B,24,68)	Switch(8EJ)	CSN1068

RESISTORS

Circuit Symbol and No.		Part No.
R 101	(B,60,73)	RS1/10SR2R4J
R 102	(B,59,71)	RS1/10SR2R4J
R 103	(B,60,71)	RS1/10SR2R7J
R 104	(B,52,69)	RS1/16SS222J
R 105	(B,41,57)	RS1/16SS102J
R 107	(B,41,59)	RS1/16SS105J
R 202	(B,32,62)	RS1/16SS473J
R 203	(B,42,45)	RS1/16S473J
R 204	(A,25,61)	RS1/16SS221J
R 206	(B,26,53)	RS1/16SS104J
R 210	(B,13,32)	RS1/16SS102J
R 214	(B,36,34)	RS1/16SS472J
R 216	(B,47,49)	RS1/16SS472J
R 221	(B,36,32)	RS1/16SS103J
R 222	(B,35,32)	RS1/16SS103J
R 225	(A,49,49)	RS1/16SS103J
R 226	(A,49,50)	RS1/16SS393J
R 227	(B,45,51)	RS1/16SS562J
R 228	(B,42,53)	RS1/16SS122J
R 229	(B,44,53)	RS1/16SS472J
R 230	(B,21,28)	RS1/16SS0R0J
R 232	(B,43,51)	RS1/16SS122J
R 233	(B,29,52)	RS1/16SS103J
R 234	(B,30,61)	RS1/16SS473J
R 235	(A,25,63)	RS1/16SS473J
R 239	(B,26,48)	RS1/16SS473J
R 240	(B,10,31)	RS1/16SS473J
R 241	(B,9,32)	RS1/16SS103J
R 244	(A,20,52)	RS1/16SS473J
R 255	(A,27,63)	RAB4CQ104J
R 307	(A,34,19)	RS1/16SS183J
R 308	(A,38,20)	RS1/16SS183J
R 309	(A,35,21)	RS1/16SS183J
R 310	(A,38,21)	RS1/16SS183J
R 601	(B,28,38)	RS1/16SS0R0J
R 602	(B,27,41)	RS1/16SS0R0J
R 606	(B,23,41)	RS1/16SS0R0J
R 701	(B,16,35)	RS1/16SS221J
R 702	(A,23,55)	RS1/16SS221J

CAPACITORS

C 106	(B,56,69)	CKSQYB475K6R3
C 202	(A,27,57)	CKSSYB104K10
C 204	(A,24,63)	CKSSYB103K16
C 205	(B,23,43)	CKSQYB475K6R3
C 206	(A,22,39)	CKSSYB104K10
C 207	(A,24,37)	CKSRYB104K16
C 209	(B,33,40)	CEVW220M6R3
C 210	(B,29,42)	CKSSYB104K10
C 211	(A,27,34)	CKSSYB104K10
C 212	(B,29,32)	CKSRYB104K16
C 213	(A,44,37)	CKSSYB104K10
C 214	(A,28,33)	CKSSYB104K10
C 216	(A,50,51)	CKSSYB332K50
C 217	(A,46,51)	CKSSYB104K10
C 218	(A,49,51)	CKSSYB473K10
C 219	(A,45,53)	CKSSYB104K10
C 220	(A,46,53)	CKSSYB182K50
C 221	(A,44,53)	CKSSYB104K10

Circuit Symbol and No.		Part No.
C 222	(B,43,53)	CCSSCH560J50
C 223	(B,45,53)	CCSSCH4R0C50
C 224	(A,43,55)	CKSSYB104K10
C 226	(A,40,58)	CCSSCH680J50
C 227	(A,40,60)	CCSSCH470J50
C 228	(A,39,62)	CKSSYB103K16
C 229	(B,49,59)	CKSSYB104K10
C 236	(A,42,61)	CKSSYB104K10
C 239	(B,44,51)	CCSSCH220J50
C 240	(A,35,61)	CKSSYB104K10
C 250	(B,36,30)	CKSSYB102K50
C 251	(B,33,29)	CKSSYB102K50
C 303	(A,35,19)	CKSSYB472K25
C 304	(A,34,21)	CKSSYB223K16
C 307	(B,25,9)	CKSRYB104K16
C 308	(B,10,27)	CKSRYB105K10
C 703	(B,11,37)	CCSSCH101J50
C 704	(B,8,36)	CKSSYB102K50
C 711	(A,25,26)	CKSSYB104K10

Miscellaneous Parts List

	Pickup Unit(P10.5)(Service)	CXX1942
M 1	Motor Unit(SPINDLE)	CXC7134
M 2	Motor Unit(LOADING/CARRIAGE)	CXC4026

Pioneer sound.vision.soul

Service Manual

ORDER NO.
CRT3815

CD MECHANISM MODULE(S10.5COMP2)

CX-3195

This service manual describes the operation of the CD mechanism module incorporated in models listed in the table below.
When performing repairs use this manual together with the specific manual for model under repair.

Model	Service Manual	CD Mechanism Module
DEH-2900MP/XN/EW5 DEH-2920MP/XN/EW5 DEH-2900MPB/XN/EW5 DEH-2910MP/XN/UR	CRT3802	CXK5760
DEH-2950MP/XN/ES DEH-2950MP/XN/ES1 DEH-2990MP/XN/ID	CRT3820	CXK5760
DEH-P390MP/XU/UC DEH-P3900MP/XU/UC	CRT3816	CXK5760
DEH-P4950MP/XU/ES DEH-P4950MP/XU/CN5	CRT3817	CXK5760
DEH-P2900MP/XU/UC	CRT3823	CXK5760
DEH-P3950MP/XU/ES DEH-P3950MP/XU/CN5	CRT3824	CXK5760
DEH-P5900MP/XU/EW5	CRT3828	CXK5760

Model	Service Manual	CD Mechanism Module
DEH-3900MP/XN/EW5	CRT3804	CXK5760
DEH-3990MP/XN/ID	CRT3829	CXK5760
DEH-P40MP/XU/EW5	CRT3834	CXK5760
DEH-P4950MP/XU/ES	CRT3835	CXK5760
DEH-P490IB/XN/UC DEH-P4900IB/XN/UC	CRT3846	CXK5760
DEH-P4900IB/XN/EW5	CRT3847	CXK5760
DEH-P5950IB/XN/ES DEH-P5950IB/XN/ES1 DEH-P5990IB/XN/ID	CRT3848	CXK5760
DEH-P590IB/XN/UC DEH-P5900IB/XN/UC	CRT3851	CXK5760
DEH-P6900IB/XN/EW5	CRT3852	CXK5760
DEH-P6950IB/XN/ES DEH-P6950IB/XN/ES1	CRT3853	CXK5760

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K-ZZA. OCT. 2006 Printed in Japan

CONTENTS

1. CIRCUIT DESCRIPTIONS

The recent mainstay of the CD LSI is the LSI integrating the core DSP with DAC or RF amplifier, which are generally employed as peripheral circuits, however, PE5547A, used in this product, is an LSI integrating the afore-mentioned LSI unit and microcomputer unit in one chip.

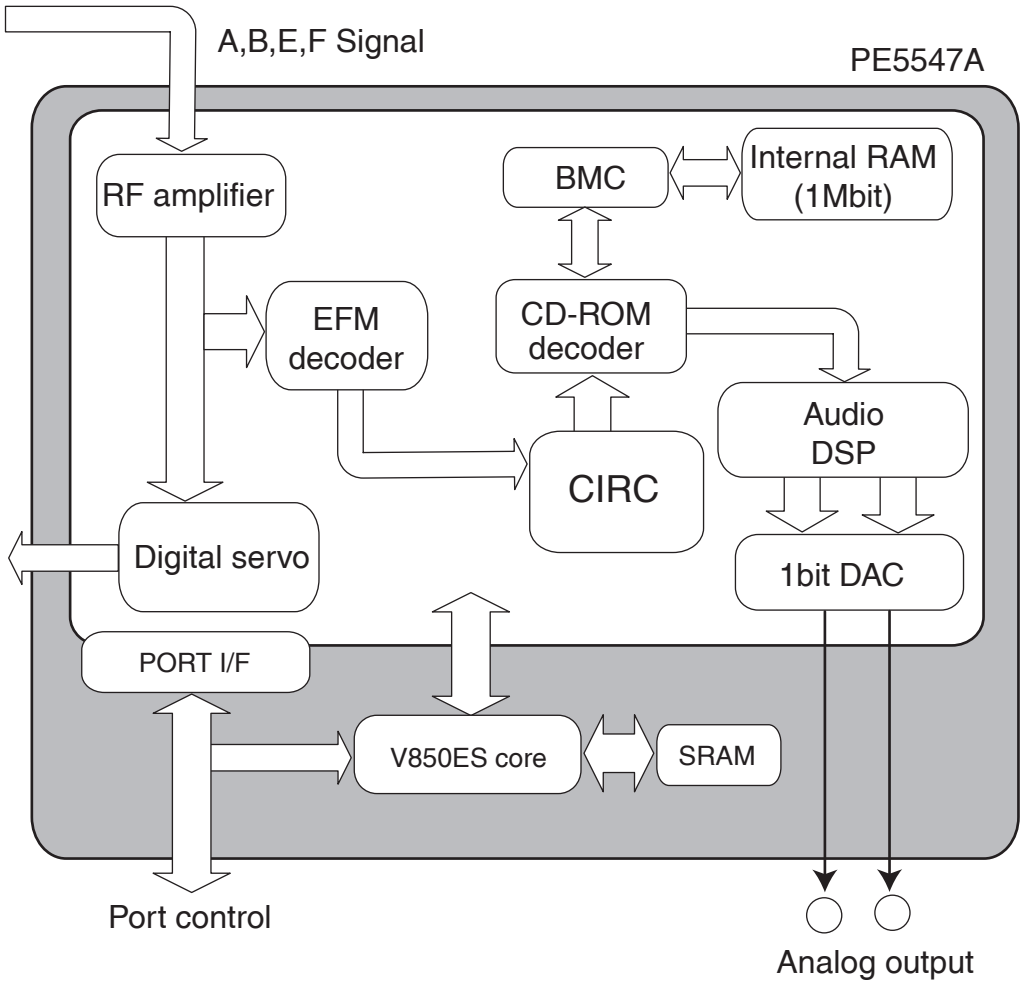


Fig.1.0.1 Block diagram of CD LSI PE5547A

1.1 PREAMPLIFIER BLOCK

In the preamplifier block, the pickup output signals are processed to generate signals that are used in the subsequent blocks: servo, demodulator, and control blocks. Signals from the pickup are I/V converted in the pickup with the preamplifier with built-in photo detectors, and after added with the RF amplifier, they are used to produce such signals as RF, FE, TE, and TE zero-cross signals. The preamplifier block is built in CD LSI PE5547A (IC201), whose parts are described individually below. Incidentally, as this LSI employs a single power supply (+ 3.3 V) specification, the reference voltages of this LSI and the pickup are the REFO (1.65 V) for both. The REFO is an output obtained from REFOUT in the LSI via the buffer amplifier, and is output from the pin 133 of this LSI. All measurements will be performed with this REFO as the reference.

Caution: Be careful not to short-circuit the REFO and GND when measuring.

1.1.1 APC (Automatic Power Control) circuit

Since laser diodes have extremely negative temperature characteristics in optical output when driven in constant current, it is necessary to control the current with the monitor diodes in order to keep the output constant. This is the feature of the APC circuit. The LD current is obtained by measuring the voltage between LD1 and V3R3, and divide the value by 7.5 (ohms), which becomes about 30 mA. The voltage between LD1 and V3R3 is set to about 225 mV.

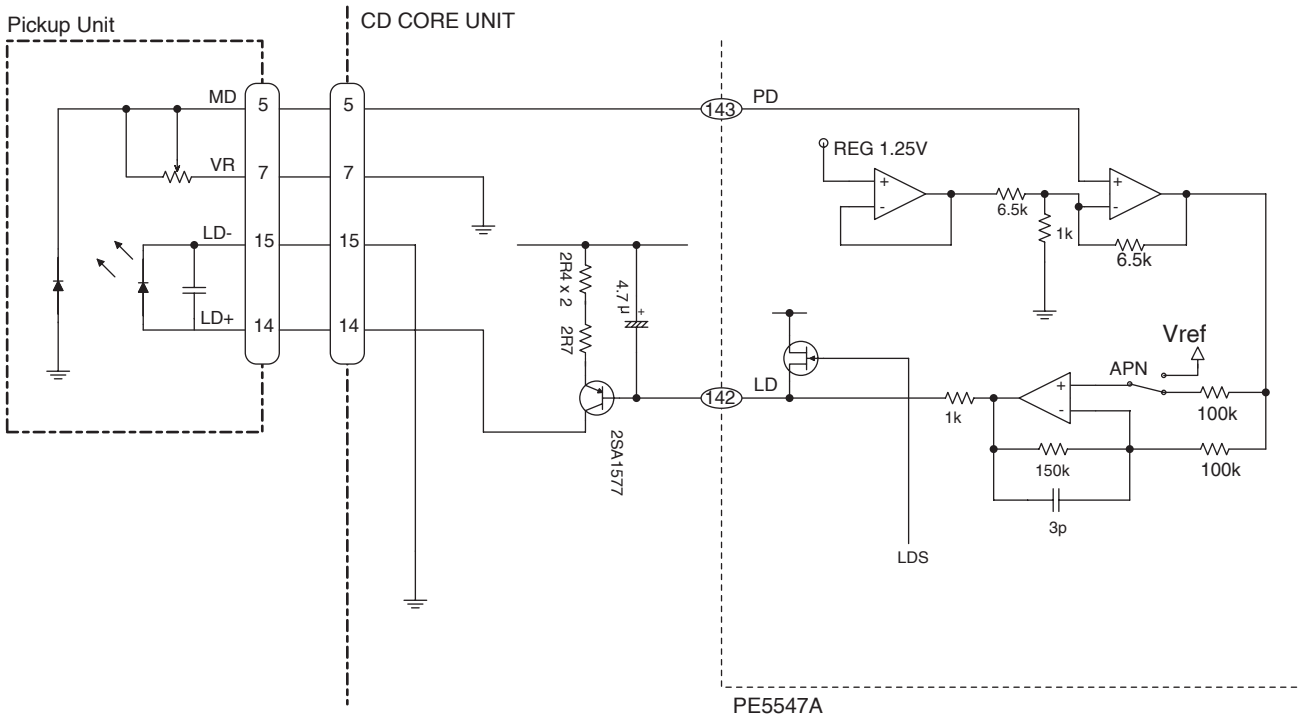


Fig.1.1.1 APC

1.1.2 RF and RFAGC amplifiers

The output from the photo-detector (A + C) and (B + D) is provided from the RFO terminal as the RF signal (which can be used for eye-pattern check), after it is added, amplified, and equalized inside this LSI. The low frequency component of the voltage RFO is calculated as below.

RFO = (A + B + C + D) x 2

The RFO is used for the FOK generation circuit and RF offset adjustment circuit.

The RFO signal, output from the pin 122, is A/C-coupled externally, input to the pin 121, and amplified in the RFAGC amplifier to obtain the RFAGC signal.

Also, this LSI is equipped with the RFAGC auto-adjustment function, explained below, which switches feedback gains of the RFAGC amplifier so that the RFO output will be 1.5 V.

This RFO signal is also used for the EFM, DFCT, MIRR, and RFAGC auto-adjustment circuits.

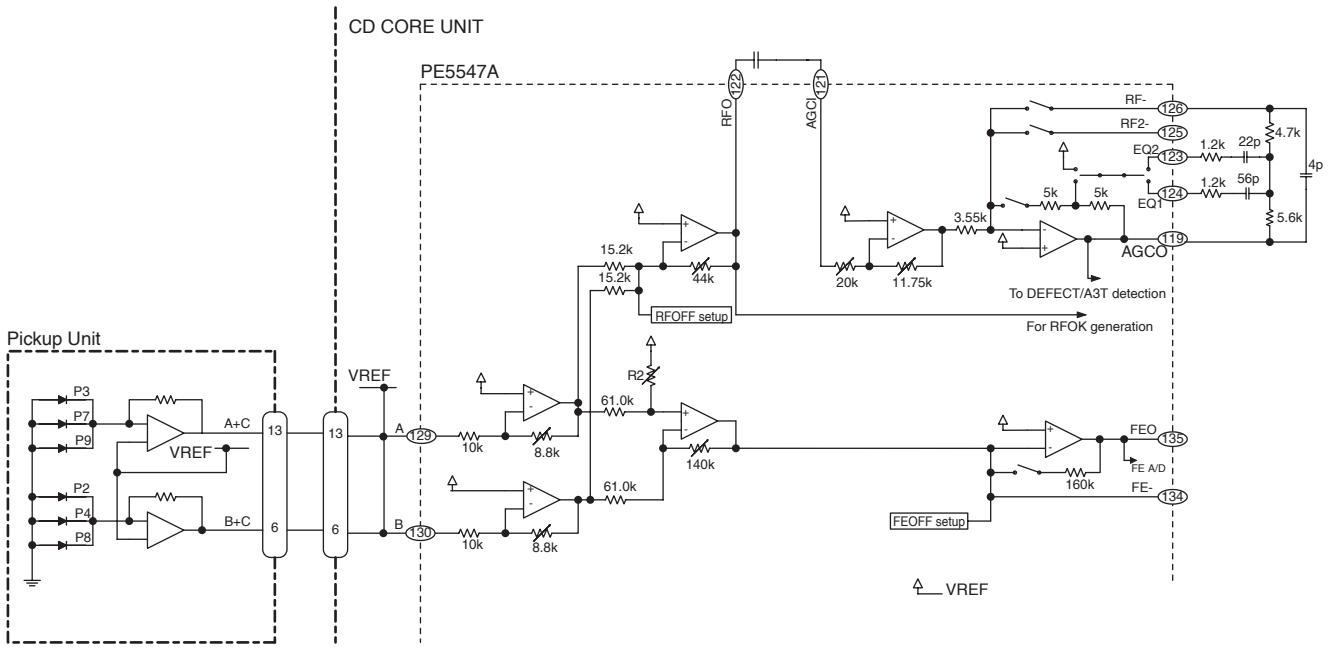


Fig.1.1.2 RF/AGC/FE

1.1.3 Focus error amplifier

The photo-detector outputs (A + C) and (B + D) are passed through the differential amplifier and the error amplifier, and (A + C - B - D) is provided from the pin 135 as the FE signal. The low frequency component of the voltage FE is calculated as below.

FE = (A + C - B - D) x 8.8k / 10k x 111k / 61k x 160k / 72k

= (A + C - B - D) x 3.5

For the FE outputs, an S-shaped curve of 1.5 Vp-p is obtained with the REFO as the reference. The cutoff frequency for the subsequent stage amplifiers is 14.6 kHz.

1.1.4 RFOK circuit

This circuit generates the RFOK signal, which indicates the timing to close the focus loop and focus-close status during the play mode, from the pin 70. As for the signal, "H" is output in closing the focus loop and during the play mode.

Additionally, the RFOK becomes "H" even in a non-pit area, since the DC level of the RFO signal is peak-held in the subsequent digital block and compared at a certain threshold level to generate the RFOK signal. Therefore, the focus is closed even on a mirror-surface area of a disc. This signal is also supplied to the microcomputer via the low-pass filer as the FOK signal, which is used for protection and gain switching of the RF amplifier.

1.1.5 Tracking error amplifier

The photo-detector outputs E and F are passed through the differential amplifier and the error amplifier to obtain (E - F), and then provided from the pin 138 as the TE signal. The low frequency component of the voltage TE is calculated as below.

TEO = (E - F) x 63k / 112k x 160k / 160k x 181k / 45.4k x 160k / 80k

= (E - F) x 4.48

For the TE output, TE waveform of about 1.3 Vp-p with the REFO as the reference. The cutoff frequency in the subsequent is 21.1 kHz.

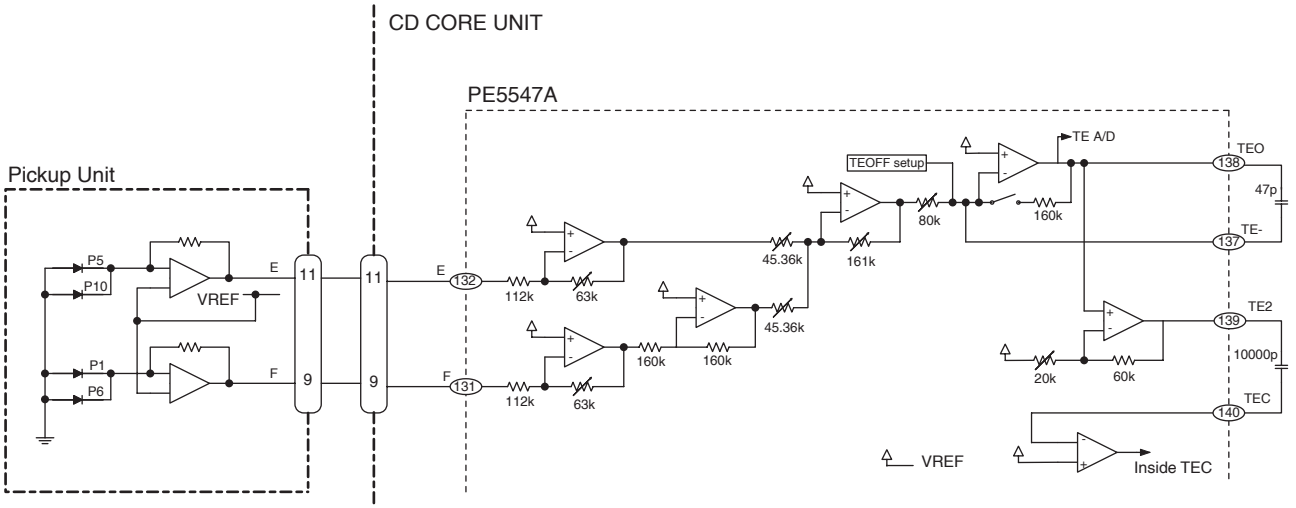


Fig.1.1.3 TE

1.1.6 Tracking zero-cross amplifier

The tracking zero-cross signal (hereinafter referred to as TEC signal) is obtained by amplifying the TE signal by fourfold, and used to detect the tracking-error zero-cross point. As the purpose of detecting the zero-cross point, the following two points can be named:

1. To use for track-counting in the carriage move and track jump modes
2. To use for detecting the direction in which the lens moves in tracking close. (Used in the tracking brake circuit to be explained later.)

The frequency range of the TEC signal is from 300 Hz to 20 kHz, and

TEC voltage = TE level x 4

The TEC level can be calculated at 4.62 V, which, at this level, exceeds the D range of the operational amplifier, and clips the signal, but, because the CD LSI only uses the signal at the zero-cross point, it poses no particular problem.

1.1.7 EFM circuit

The EFM circuit converts the RF signal into digital signals of 0 and 1. The AGCO signal output from the pin 119 is A/C-coupled externally, input to the pin 118, and supplied to the EFM circuit.

Missing RF signal due to scratches and stains on the disc, and asymmetry of the upper and lower parts of the RF, caused by variation in disc production, cannot be entirely eliminated in AC coupling process, the reference voltage ASY of the EFM comparator is controlled, using the probability that 0 and 1 occur at 50%. Thus, the comparator level will always stay around the center of the RFO signal. This reference voltage ASY is generated by passing the EFM comparator output through the low-pass filter. The EFM signal is output from the pin 113.

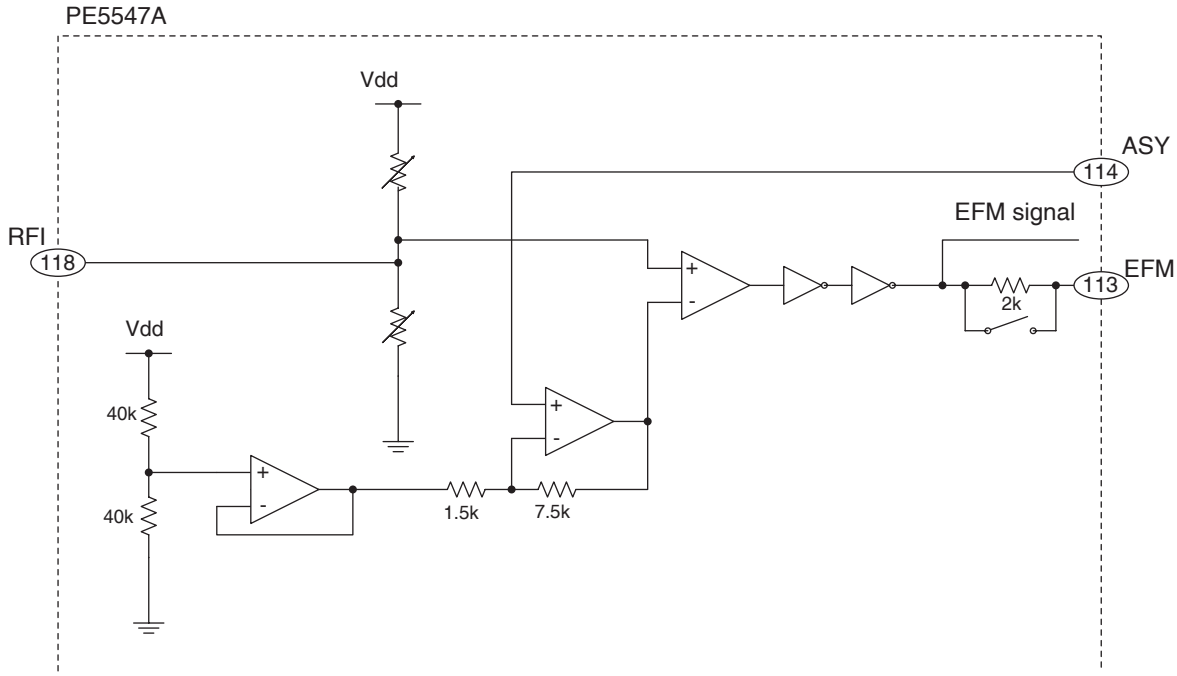


Fig.1.1.4 EFM

1.2 SERVO BLOCK (PE5547A: IC201)

The servo block performs servo control such as error signal equalizing, in-focus, track jump and carriage move. The DSP block is the signal-processing unit, where data decoding, error correction, and compensation are performed. The FE and TE signals, generated in the preamplifier stage, are A/D-converted, and output drive signals for the focus, tracking, and carriage systems via the servo block. Also, the EFM signal is decoded in the signal-processing unit, and ends up in outputting D/A-converted audio signals through the D/A converter. Furthermore, in this decoding process, the spindle servo error signal is generated, supplied to the spindle servo block, and used to output the spindle drive signal.

Each drive signal for focus, tracking, carriage, and spindle servos (FD, TD, SD, and MD) are output as PWM3 data, and then converted to analog data through the LPF. These drive signals, after changed to analog form, can be monitored with the FIN, TIN, CIN, and SIN signals, respectively. Subsequently, the signals are amplified and supplied to the actuator and motor for each signal.

1.2.1 Focus servo system

The main equalizer of the focus servo consists of the digital equalizer block. The figure 1.2.1 shows the block diagram of the focus servo system.

In the focus servo system, it is necessary to move the lens within the in-focus range in order to close the focus loop. For that purpose, the in-focus point is looked for by moving the lens up and down with the focus search voltage of triangular signal. During this time, the rotation of the spindle motor is retained at a certain set speed by kicking the spindle motor.

The servo LSI monitors the FE and RFOK signals and automatically performs the focus-close operations at an appropriate timing. The focus-close operation is performed when the following three conditions are satisfied at the same time:

1) The lens moves toward the disc surface.
2) RFOK = "H"
3) The FE signal is zero-crossed.

Consequently, the FE converges to "0" (= REFO).

When the above-mentioned conditions are met and the focus loop is closed, the FSS bit is shifted from "H" to "L," and then, in 10 ms, the CPU of the LSI starts monitoring the RFOK signal obtained through the low-pass filter.

If the RFOK signal is determined to be "L," the CPU of the LSI takes several actions including protection.

Fig.1.2.2 shows a series of actions concerning the focus close operations. (It shows a case where the focus loop cannot be closed.)

With the focus mode selector displaying 01 in the test mode, pressing the focus close button, allows to check the S-shaped curve, search voltage, and actual lens behavior.

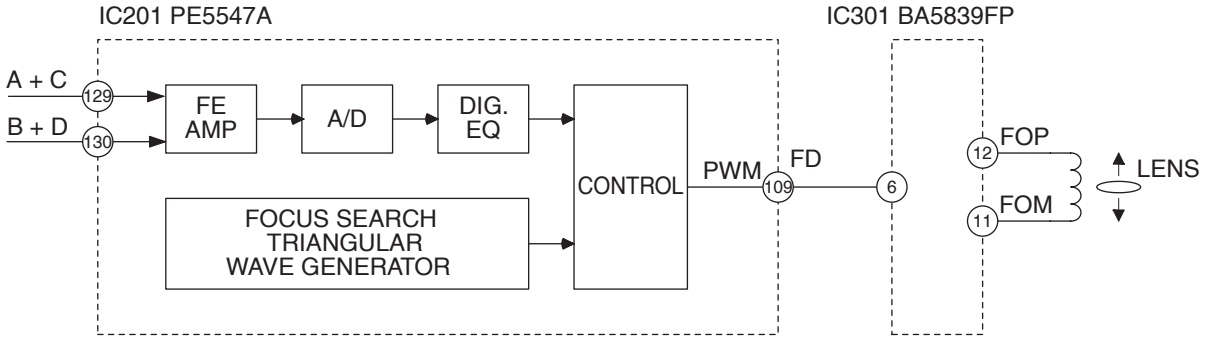


Fig.1.2.1 Block diagram of the focus servo system

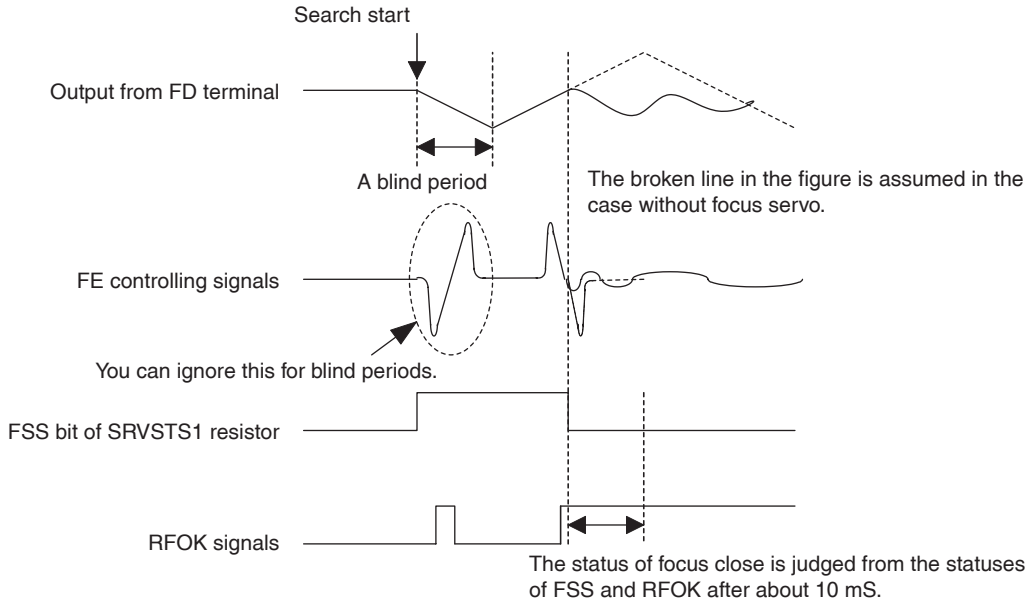


Fig.1.2.2 Timing chart for focus close operations

1.2.2 Tracking servo system

The main equalizer of the tracking servo consists of the digital equalizer block. The figure 1.2.3 shows the block diagram of the tracking servo system.

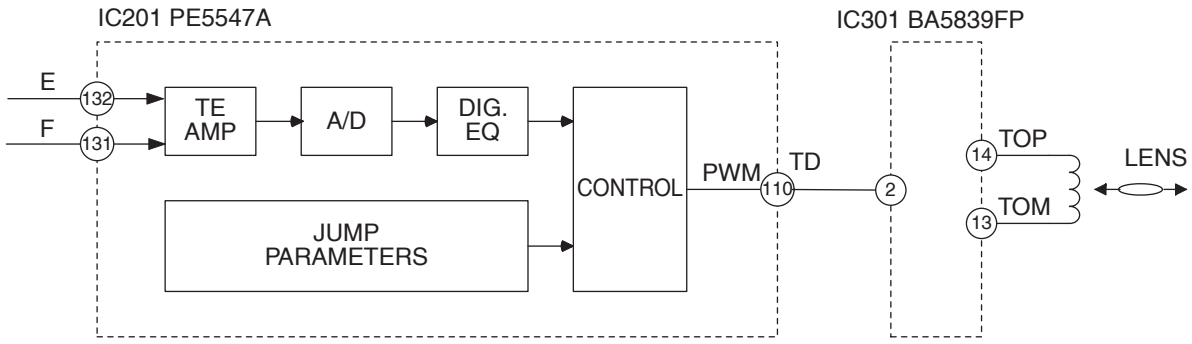


Fig.1.2.3 Block diagram of the tracking servo system

(a) The track jump operation is automatically performed by the auto-sequence function inside the LSI with a command from the CPU of the LSI. For the track jumps used in the search mode, a single track jump and four to 100 multi-track jump are available in this system. In the test mode, out of these track jumps, 1, 32, and 32 * 3 track jumps, as well as carriage move can be performed and checked in mode selection. In a track jump, the CPU of the LSI sets about half the number of the total tracks to jump (about five tracks for a 10-track jump), and the set number of tracks are counted using the TEC signal. By outputting the brake pulse for a certain period of time (set by the CPU of the LSI) from the time the set number is counted, and stopping the lens, the tracking loop can be closed so that the normal play can be continued.

Also, in order to facilitate closing of the tracking loop in a track jump, the brake circuit is kept ON for 50 msec, after the brake pulse is stopped, for increasing the tracking servo gain. The FF/REW action in the normal operation mode is realized by performing single jumps consecutively. The speed is approximately 10 times faster than in the normal mode.

(b) Brake circuit

Since the servo loop is not closed very well in the setup mode and track jump mode, the brake circuit is used for stabilizing the servo-loop close operation. The brake circuit detects the direction in which the lens moves, and outputs only the drive signal for the direction opposite to the movement to slow down the lens, thereby stabilizing the tracking servo-loop close operation. Additionally, the off-track direction is determined from the TEC and MIRR signals, as well as their phase relation.

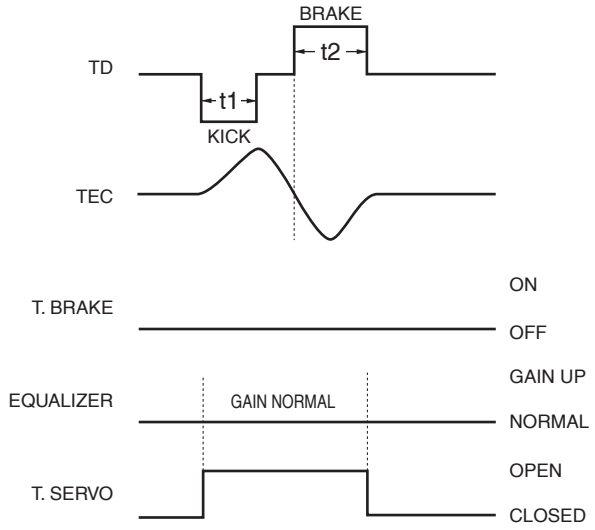


Fig.1.2.4 Single-track jump

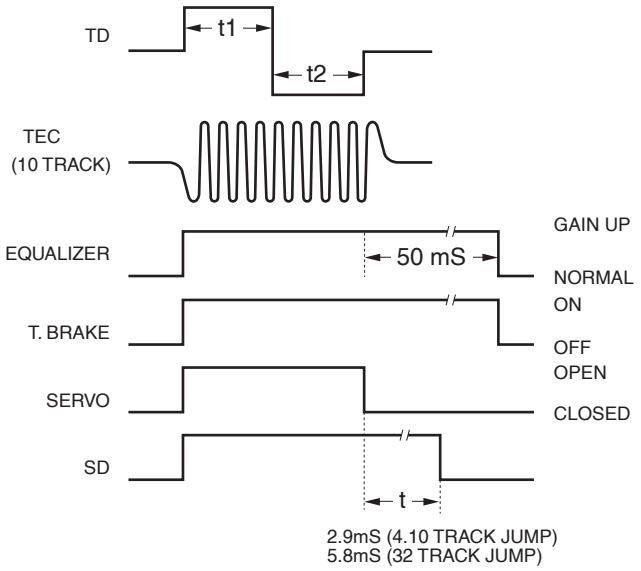
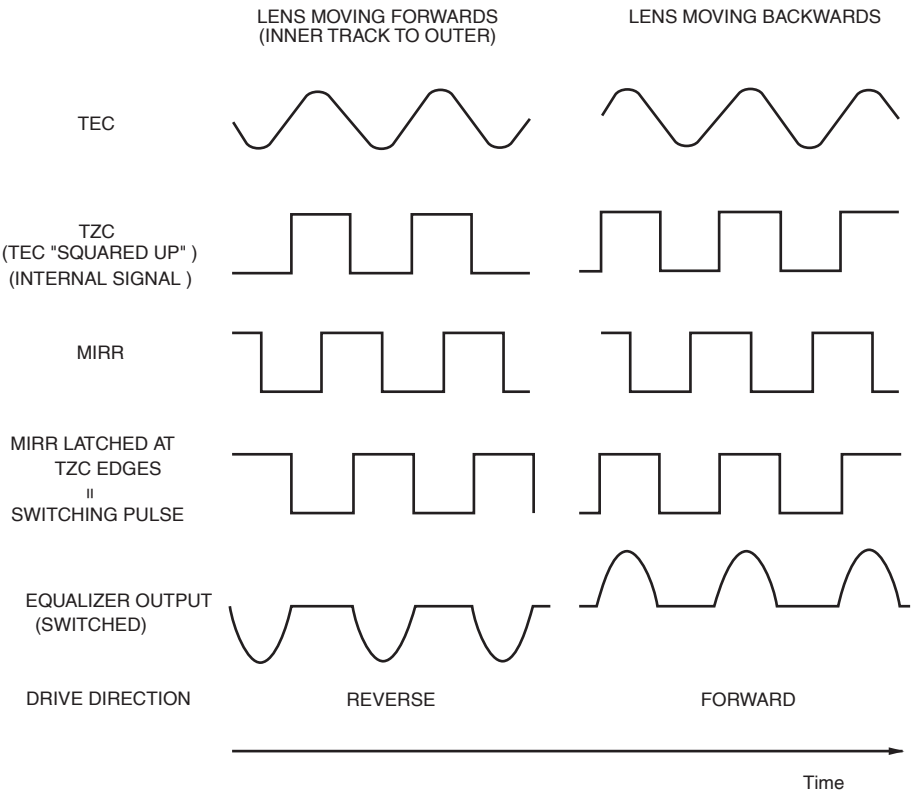


Fig.1.2.5 Multi-track jump



Note : Equalizer output assumed to hava same phase as TEC.

Fig.1.2.6 Track brake

1.2.3 Carriage servo system

The carriage servo system inputs the output of the low frequency component from the tracking equalizer (information on the lens position) to the carriage equalizer, and, after the gain is increased to a certain level, outputs the drive signal from the CD of the LSI. This signal is applied to the carriage motor via the driver IC.

Specifically, since it is necessary to move the whole pickup to the FORWARD direction when the lens offset reaches a certain level during the play mode, the equalizer gain is set to output higher voltage than the carriage motor starting voltage at this time. In actual operations, a certain threshold level is preset in the servo LSI for the equalizer output, and only when it exceeds the threshold level, the drive voltage will be output. This can reduce the power consumption. Also, before the whole pickup starts moving, the equalizer output voltage may exceed the threshold level a few times, due to such causes as eccentricity of discs. In this case, the output waveform of the drive voltage from the LSI assumes a pulse-like form.

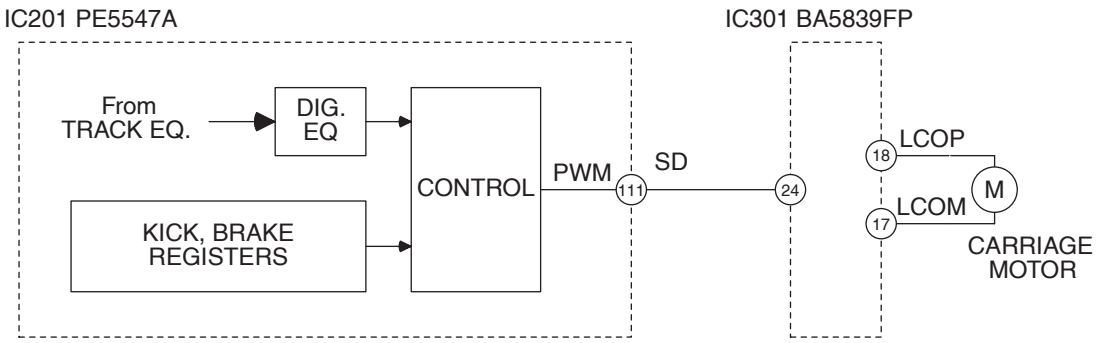


Fig.1.2.7 Block diagram for the carriage servo block

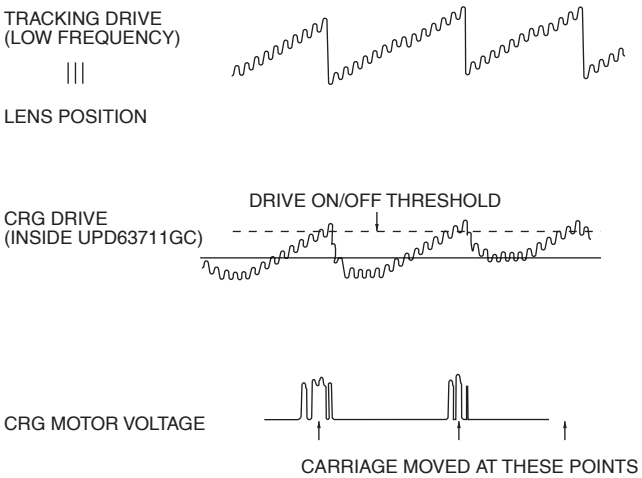


Fig.1.2.8 Waveforms of the carriage signal

1.2.4 Spindle servo system

In the spindle servo system, the following modes are available:

1) Kick

Used to accelerate the disc rotation in the setup mode.

2) Offset

a. Used in the setup mode after the kick mode, until the TBAL adjustment is completed.

b. Used during the play mode when the focus loop is unlocked, until it is locked again.

In both cases, the mode is used to keep the disc rotation approximately normal.

3) Applicable servo

CLV servo mode, used in the normal operation.

In the EFM demodulation block, by WFCK/16 sampling whether the frame sync signal and the internal frame counter output are synchronized, a signal is created to show if they are "in-sync" or "non-sync." The status is not recognized as asynchronous until the signal is "non-sync" for eight consecutive times; otherwise it is recognized as synchronous. In the applicable servo mode, the leading-in servo mode is automatically selected in the asynchronous status, and the normal servo mode in the synchronous status.

4) Brake

Used to stop the spindle motor.

In accordance with the CPU of the LSI command, the brake voltage is sent out from the servo LSI. At this time, the EFM waveform is monitored in the LSI, and when the longest EFM pattern exceeds a certain interval (or the rotation slows down enough), a flag is set inside the CD of the LSI, and the CPU of the LSI switches off the brake voltage. If a flag is not set within a certain period, the CPU of the LSI shifts the mode from the brake mode to the stop mode, and retains the mode for a certain period of time. If the mode switches to this stop mode in the eject operation, the disc will be ejected after the period of time mentioned above elapses.

5) Stop

Used when the power is turned on and during the eject operation. In the stop mode, the voltage in both ends of the spindle motor is 0 V.

6) Rough servo

Used in carriage feed (carriage move mode such as long search).

By obtaining the linear velocity from the EFM waveform, the "H" or "L" level is input to the spindle equalizer. In the test mode, this mode is also used for grating confirmation.

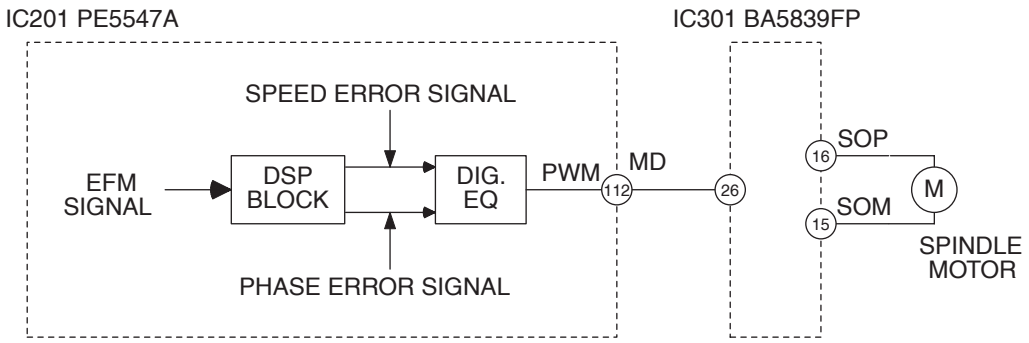


Fig.1.2.9 Block diagram of the spindle servo system

1.3 AUTOMATIC ADJUSTMENT FUNCTION

In this system, all the circuit adjustments are automated inside the CD of the LSI.
All adjustments are performed whenever a disc is inserted or the CD mode is selected by pressing the source key.
Details of each adjustment will be explained below.

1.3.1 TE, FE, and RF offset auto-adjustment

In this adjustment the TE, FE, and RF amplifier offsets of the preamplifier block in POWER ON are adjusted to the respective target values with the REFO as reference. (The target values for TE, FE, and RF offsets are 0 V, 0 V, and - 0.8 V, respectively.)

Adjusting procedure

1) The CPU of the LSI reads respective offsets through the CD of the LSI, when they are in LDOFF status.
2) The CPU of the LSI calculates the voltages for correction from the values read in 1), and substitutes the corrected values to prescribed places to adjust.

1.3.2 Tracking balance (T.BAL) auto-adjustment

This adjustment equalizes the output difference of the E-ch and F-ch from the pickup by changing the amplifier gain inside the CD of the LSI. In actual operation, adjustment is performed so that the TE waveform becomes symmetrical on each side of the REFO.

Adjusting procedure

1) After closing the focus loop,
2) Kick the lens in the radial direction to ensure the generation of the TE waveform.
3) The CPU of the LSI reads the offset amount of the TE signal calculated in the LSI at the time through the CD of the LSI.
4) The CPU of the LSI determines the offset amount is 0, positive, or negative.
- When the offset amount is 0, the adjustment is completed.
- When the offset amount is positive or negative, the amp gains for E-ch and F-ch should be changed, following a certain rule.

Then, steps 2) to 4) are repeated until the offset amount becomes 0 or the repetition reaches the limit number of times.

1.3.3 FE bias auto-adjustment

This adjustment is to maximizes the RFO level by optimizing the focus point during the play mode, utilizing the phase difference between the 3T level waveform of the RF waveform and that of when focus error disturbance is input. This adjustment is performed at the same timing as the auto-gain control, which will be described later, since disturbance is input to the focus loop.

Adjusting procedure

1) The CPU of the LSI issues the command to introduce disturbance to the focus loop (inside the CD of the servo LSI).
2) The waver of the 3T component of the RF signal is detected in the CD of the LSI.
3) The relation between the 3T component above and the disturbance is processed inside the CD of the LSI to detect the volume and direction of the focus offset.
4) The CPU of the LSI issues a command and reads out the detected results from the CD of the LSI.
5) The CPU of the LSI calculates the necessary correction and substitutes the result to the bias adjustment term inside the CD of the LSI.

Additionally, in this adjusting, a series of steps are repeated for better adjustment accuracy, the same as in the auto-gain control.

1.3.4 Focus and tracking AGC

This adjustment is to automatically adjust the focus and tracking servo loop gains.

Adjusting procedure

1) Introduce disturbance to the servo loop.

2) The error signals (FE and TE) when disturbance is introduced are extracted through the band pass filter, to obtain the G1 and G2 signals.

3) The CPU of the LSI reads the G1 and G2 signals through the CD of the LSI.

4) The CPU of the LSI calculates the necessary correction and performs the loop gain adjustment inside the CD of the LSI.

For increased adjustment accuracy, the same adjustment process is repeated a few times.

1.3.5 RF level auto-adjustment (RFAGC)

This adjustment is to adjust the dispersion of the RF level (RFO), which may be caused by mechanism or disc-related factors, to a steady value for reliable signal transmission. The adjustment is performed by changing the amp gain between RFO and RFAGC.

Adjusting procedure

1) The CPU of the LSI issues a command and reads out the output from the RF level detection circuit inside the CD of the LSI.

2) From the read values, the CPU of the LSI calculates the amp gain to change the RFO level to the target.

3) The CPU of the LSI sends a command to the CD of the LSI to adjust the amp gain to the level calculated in 2).

This adjustment is performed

1) when only the focus close operation is completed during the setup mode, and

2) immediately before the setup is completed (or when the play mode is about to start).

1.3.6 Adjustment of gains in preamplifier stage

In this adjustment, when reflected beams from the disc surface are extremely weak, such as when the lens is dirty, or a CD-RW is played, gains in the whole RFAMP block (FE, TE, and RF amplifiers) are increased by + 6 dB or + 12 dB, depending on the situation.

Adjusting procedure

When the system determines that the reflected beams from the disc surface are extremely weak during the setup mode, the whole RFAMP gains will be increased by + 6 dB or + 12 dB.

1.3.7 Initial values in adjustment

All automatic adjustments immediately after inserting a disc are performed based on the initial values. Automatic adjustments by source change or ACC ON are basically performed using the previous adjustment values as the initial values.

1.3.8 Coefficient display of adjustment results

For some of the adjustments (FE and RF offset, FZD cancel, F and T gains, and RFAGC), the adjustment results can be displayed and confirmed in the test mode.

The coefficient display in each auto adjustment is as follows:

1) FE and RF offset

Reference value = 32 (coefficient of 32 indicates that no adjustment is required)

The value is displayed in the unit of approximately 32 mV.

Ex. When the FE offset coefficient is 35,

35 - 32 = 3 x 32 mV = 96 mV

The correction is about +96 mV, which means the FE offset before adjustment is - 96 mV.

2) F and T gain adjustment

Reference value for focus and tracking = 20

The displayed coefficient / the reference value indicates the adjusted gain.

Ex. When the AGC coefficient is 40,

adjustment of 40 / 20 = 2 times (+ 6 dB) has been performed.

(It means that the original loop gain was half the target, and the whole gain was doubled to obtain the target value.)

3) RF level adjustment (RFAGC)

Reference value = 8

The coefficient of 9 to 15 indicates to increase the RF level

(for more gains).

The coefficient of 7 to 10 indicates to decrease the RF level

(for less gains).

When the coefficient changes by 1, the gain changes by 0.7 to 1 dB.

When the coefficient is 15, the gain is the maximum at TYP + 7.9 dB.

When the coefficient is 0, the gain is the minimum at TYP - 4.6 dB.

1.4 POWER SUPPLY AND LOADING BLOCK

For the power supply for this system, the VD (7.5 ± 0.5 V) and the VDD (3.3 ± 0.165 V), which are supplied from the motherboard, are used. The two power supplies, the VD mentioned above (for the drive system), and the VDD (for the LSI: 3.3 V), are used in this system.

The CPU of the LSI controls ON/OFF with "CONT", except for Load/Eject of the CD driver. For ON/OFF of the Loading drive, no particular control terminals are available, but the input signal "LOEJ" assumes an equivalent role. Also, the LCO output switches LOADING MODE and CARRIAGE MODE with "CLCONT".

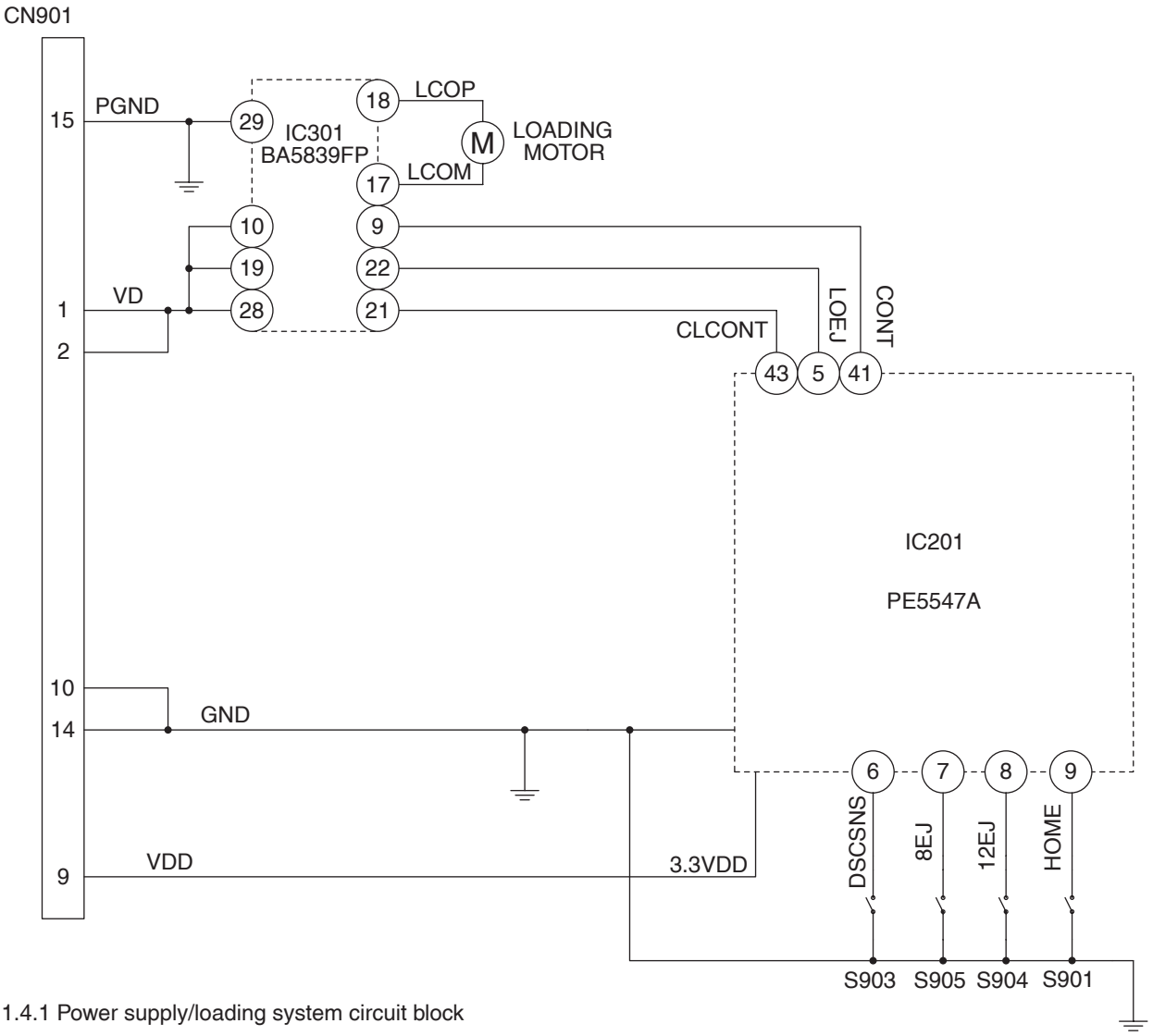


Fig.1.4.1 Power supply/loading system circuit block

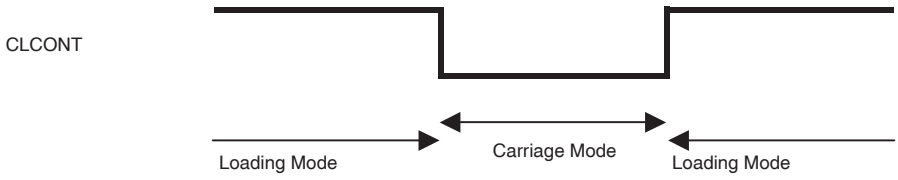


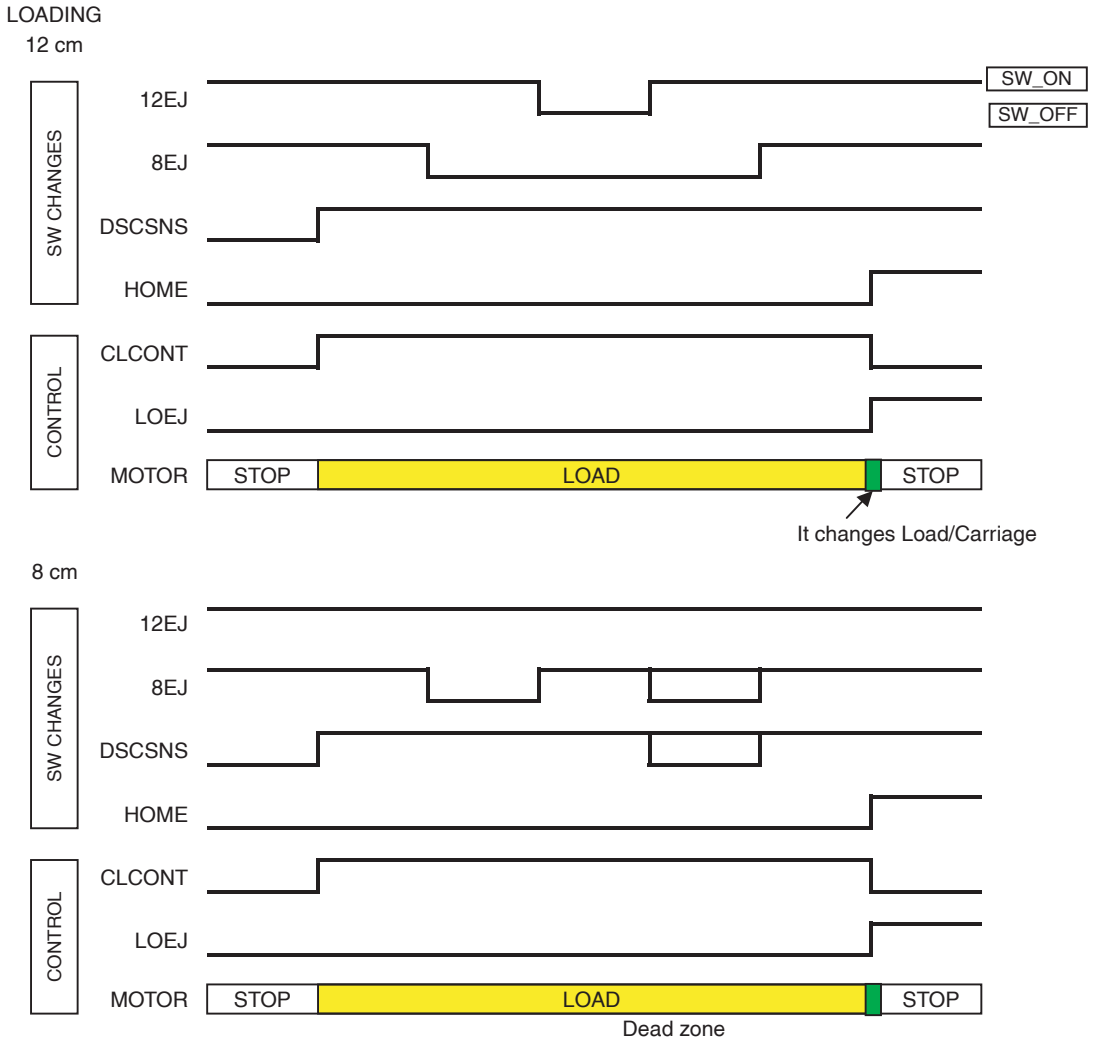
Fig.1.4.2 Loading/carriage mode shift

The load/eject operation is controlled with the status changes of the HOME switch (also used for clamp detection) on the mechanism unit and the three switches on the control unit. The ON/OFF statuses of these switches are respectively detected at the input port of the microcomputer.

Using the detection results in the microcomputer, each status (A to E) is determined. The disc size detection (8 or 12 cm) is also performed through this status change. Each status is shown in Fig.1.4.3 and the status change in Fig.1.4.4.

	Status	A	B	C	D	E
DSCSNS	SW1(S903)	OFF	ON	ON	ON	ON
8SW	SW2(S905)	ON	ON	OFF	OFF	ON
12SW	SW3(S904)	ON	ON	ON	OFF	ON
HOME	SW4(S901)	OFF	OFF	OFF	OFF	ON
	Mechanism state	With no disc				Clamp state

Fig.1.4.3 DSCSNS status



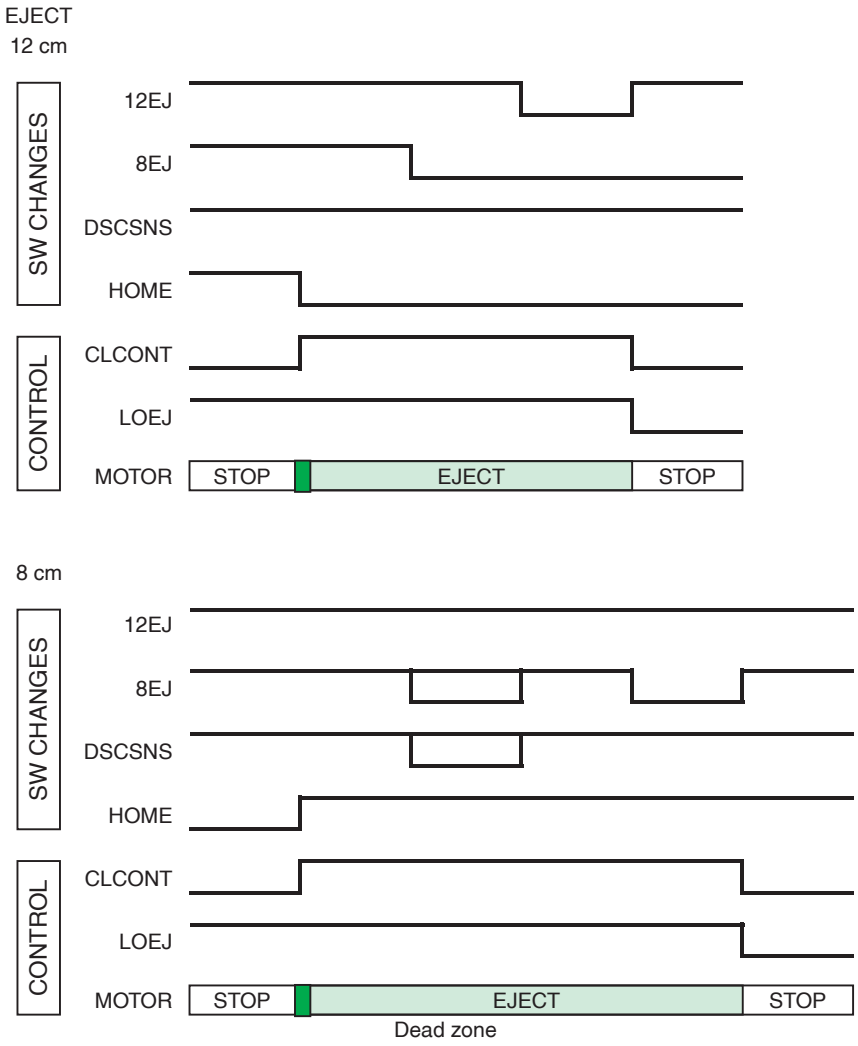
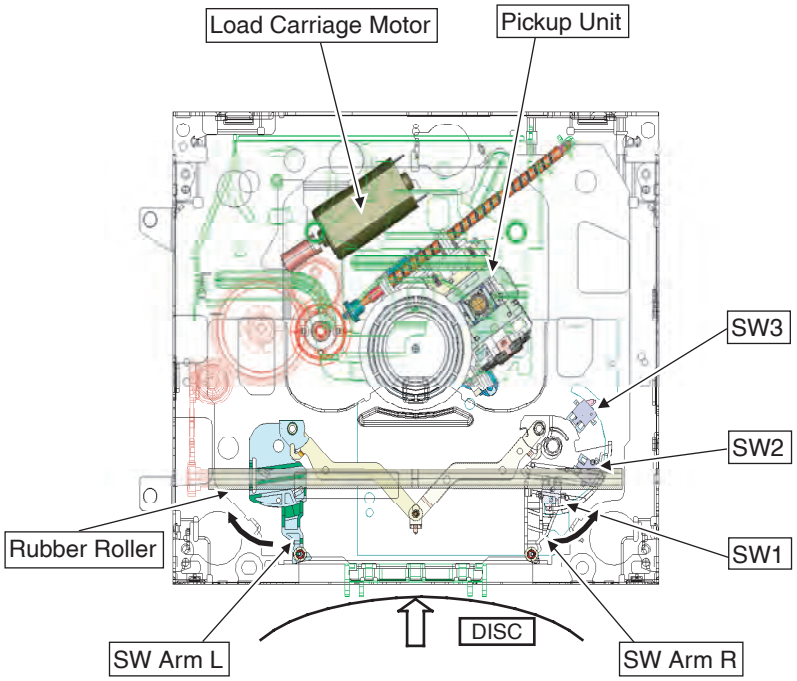


Fig.1.4.4 Status change in LOAD and EJECT modes

2. MECHANISM DESCRIPTIONS

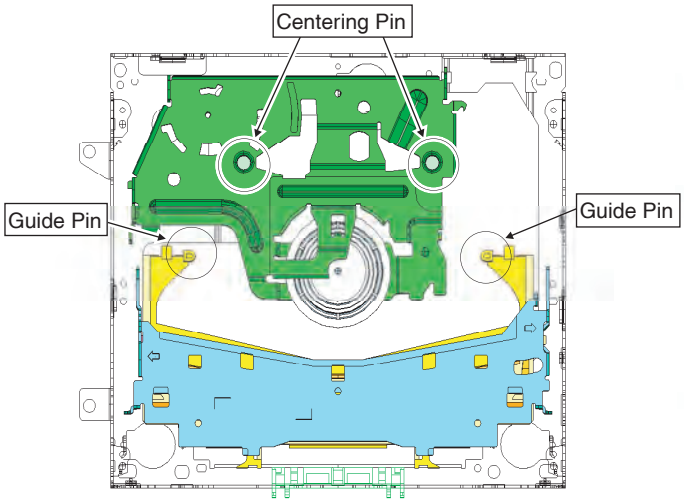
● Loading actions

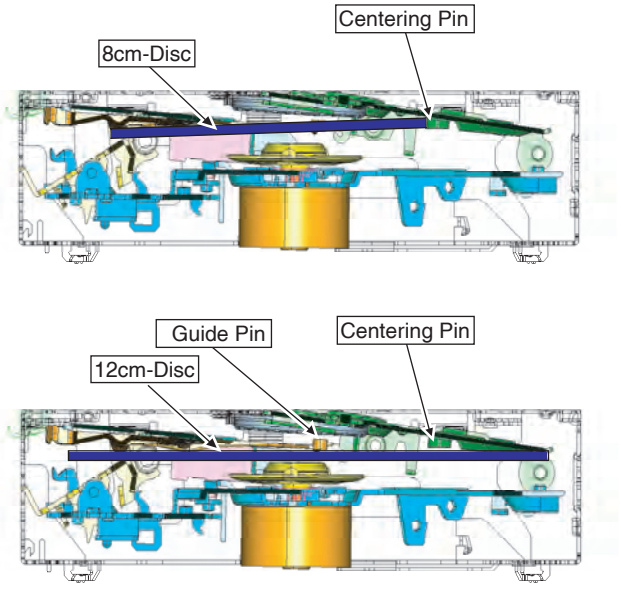
1. When a disc is inserted, SW Arm L and R rotate and SW1 is switched from ON to OFF.
   When SW1 is switched from ON to OFF, the Load Carriage Motor is started and the rubber roller rotates.
2. If the disc is a 12cm-disc, SW3 is turned ON with SW Arm, and the microcomputer determines that the disc is a 12cm-disc.
3. In case of an 8cm-disc, SW3 is not turned ON, a clamp action is triggered, and the microcomputer determines that the disc is an 8cm-disc.
   (The left and right of SW Arm are coupled, and when only one side is pushed, the coupled joint will lock, and the arms will not open more than a certain width (SW3 will not be turned ON).)



● Disc centering mechanism

1. 8cm-disc is centered by the Guide Pins and the Centering Pins.
2. 12cm-disc passes under the Guide Pins and the Centering Pins, and centered in the back position of the mechanism.





● Clamp actions mechanism

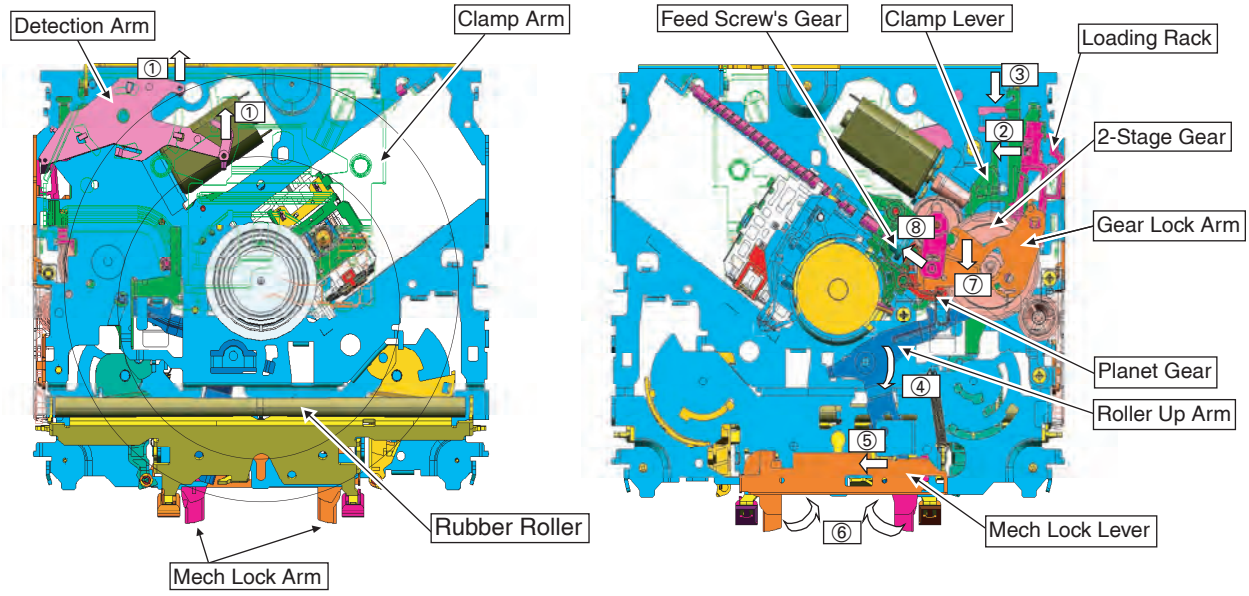
1. With an 8 or 12cm-disc centered on the spindle, the Detection Arm is moved.
2. The movement of the Detection Arm engages the Loading Rack with the 2-Stage Gear.
3. The Clamp Lever slides and lowers the Clamp Arm (the disc is clamped).

At the same time, the Roller Up Arm is rotated, and the Rubber Roller is separated from the disc.

Also the arm slides the Mechanical Lock Lever, turns the Mechanical Lock Arm, and releases the mechanical lock, completing the clamp operation.

4. When the clamp action is completed, the Clamp Lever rotates the Gear Lock Arm.

When the arm is rotated, the Planet Gear is separated from the 2-Stage Gear and engaged with the gear of the pickup feed screw, and the carriage operation will start



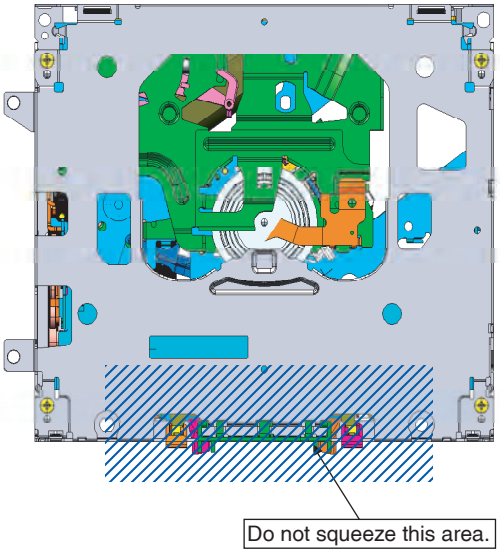
● Eject actions

1. When the Load Carriage Motor is rotated backward, and the pickup is fed to the inner periphery passing the home SW ON point, the eject action will start in the reverse order of the procedure mentioned earlier.
2. For a 12cm-disc, Eject is completed when SW3 is switched OFF, ON, and OFF again.
3. For an 8cm-disc, Eject is completed when SW2 is switched OFF, ON, and OFF again.

3. DISASSEMBLY

● How to hold the Mechanism Unit

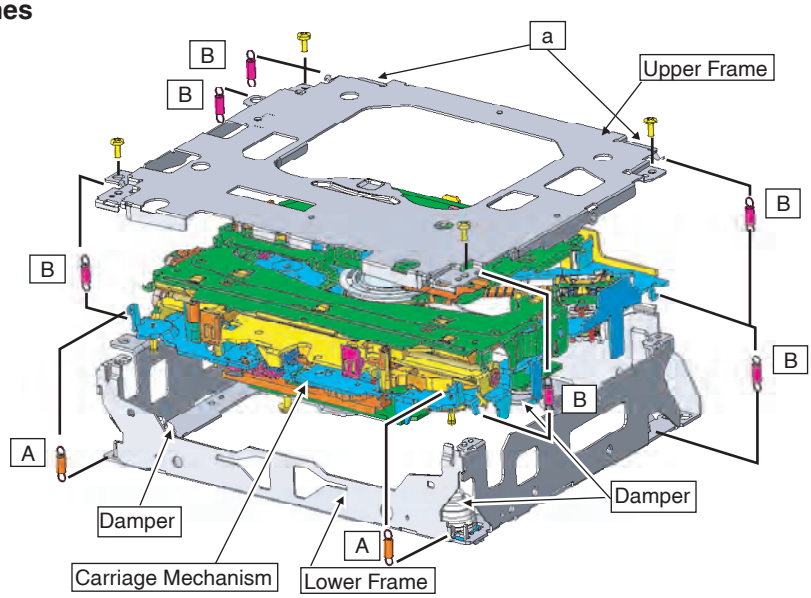
1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.



● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

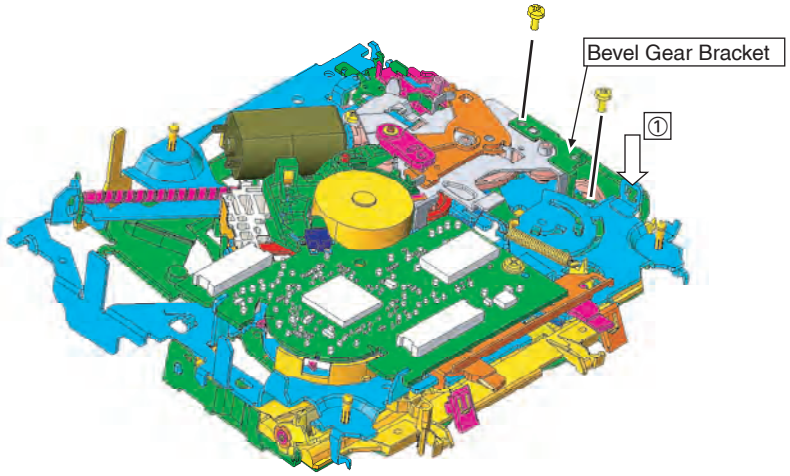
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.

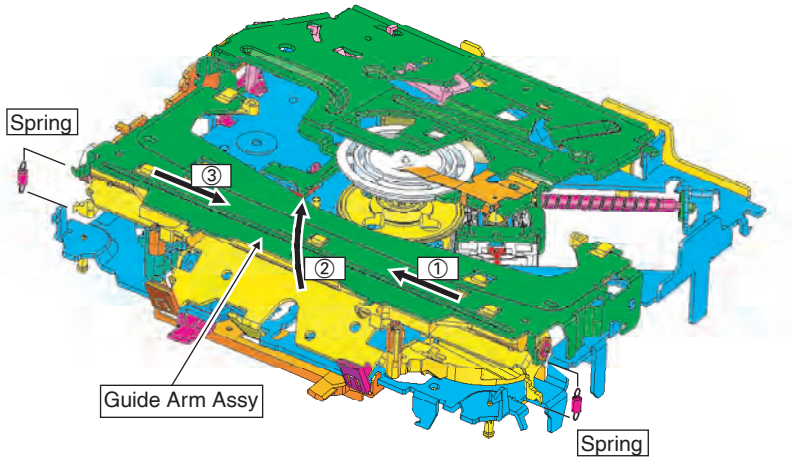


● Removing the Guide Arm Assy

1. Remove the Upper and Lower Frames and set the mechanism to the eject mode.
2. Remove the two Screws and Bevel Gear Bracket. (Note that the gears will come off.)
3. Remove the two Springs from the left and right sides.
4. Slide the Guide Arm Assy to the left, and turn it upward.
5. When it is turned about 45 degrees, slide it to the right and remove.

Caution: When assembling, assemble with the Bevel Gear Bracket moved to the direction of the arrow (①).

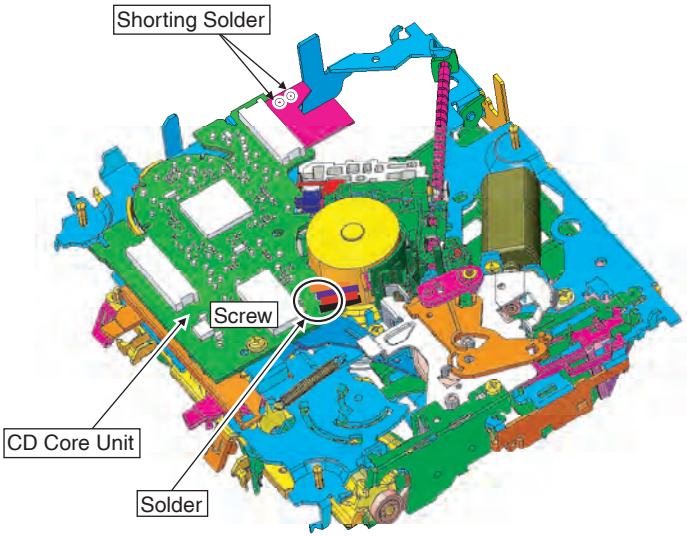




● How to remove the CD Core Unit

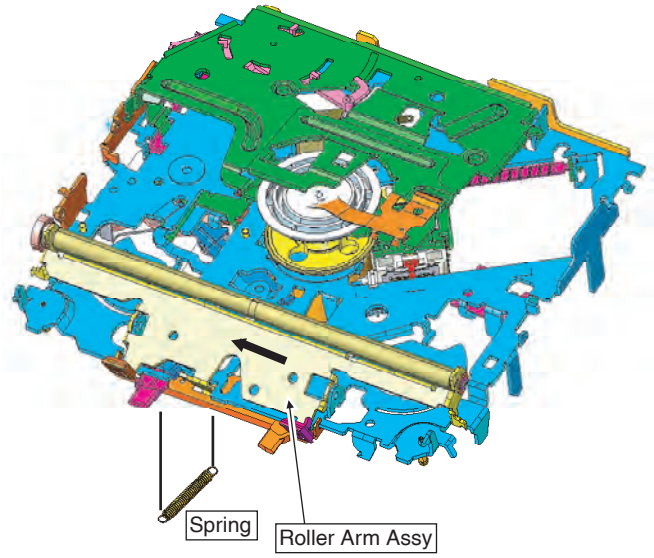
1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

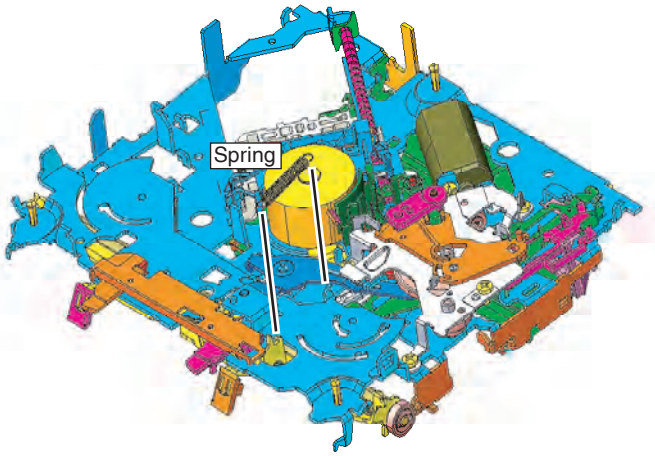
Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.



● How to remove the Roller Arm Assy

1. Remove the Guide Arm Assy.
2. Remove the CD Core Unit. (If the Spring can be removed, the unit need not be removed, depending on the type of CD Core Unit.)
3. Remove the Spring.
4. Slide the Roller Arm Assy to the left.



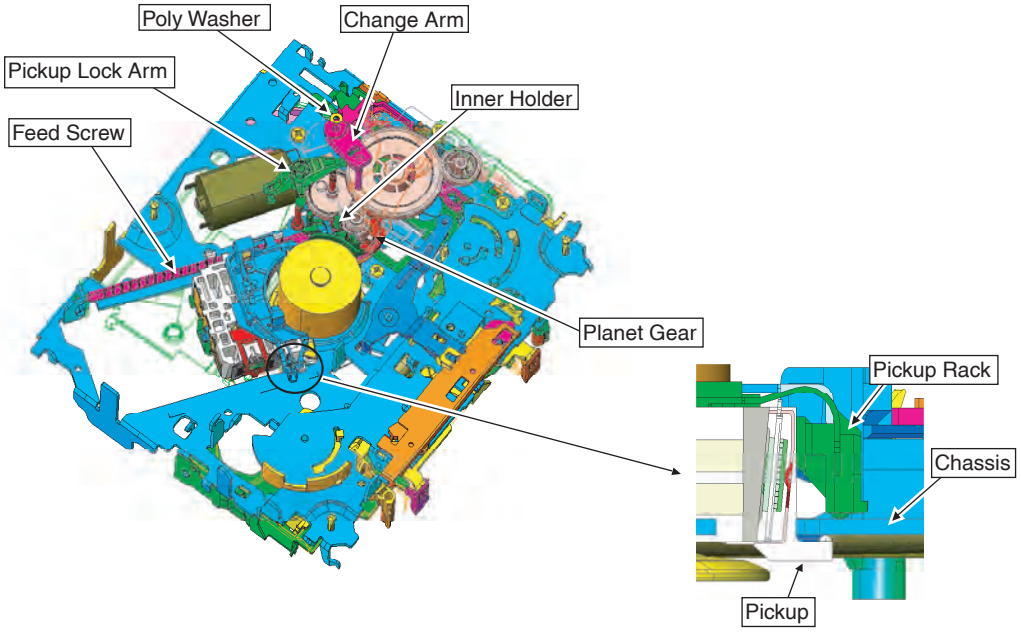


● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.

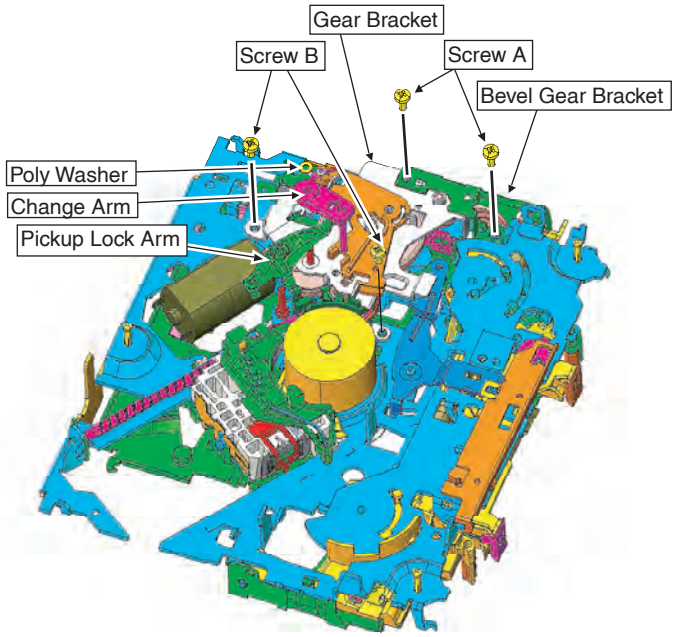
Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.

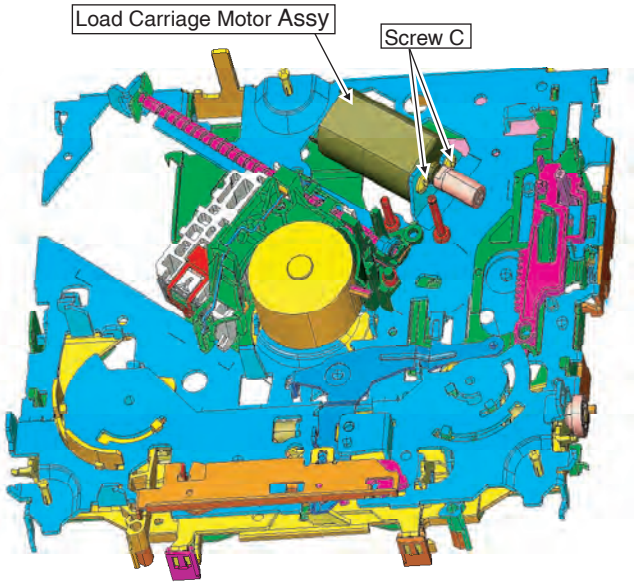


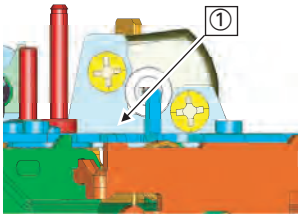
● How to remove the Load Carriage Motor Assy

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Release the leads (orange and purple) of Load Carriage Motor Assy from the CD Core Unit and remove the holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. Remove the two Screws (A) and the Bevel Gear Bracket (Note that the gears will come off).
5. Remove the two Screws (B) and the Gear Bracket (remove the CD Core Unit, if necessary), and remove all the gears.
6. Remove the two Screws (C) and the Load Carriage Motor Assy.

Caution: When assembling the Load Carriage Motor Assy, move it to the direction shown in the illustration (①).
When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



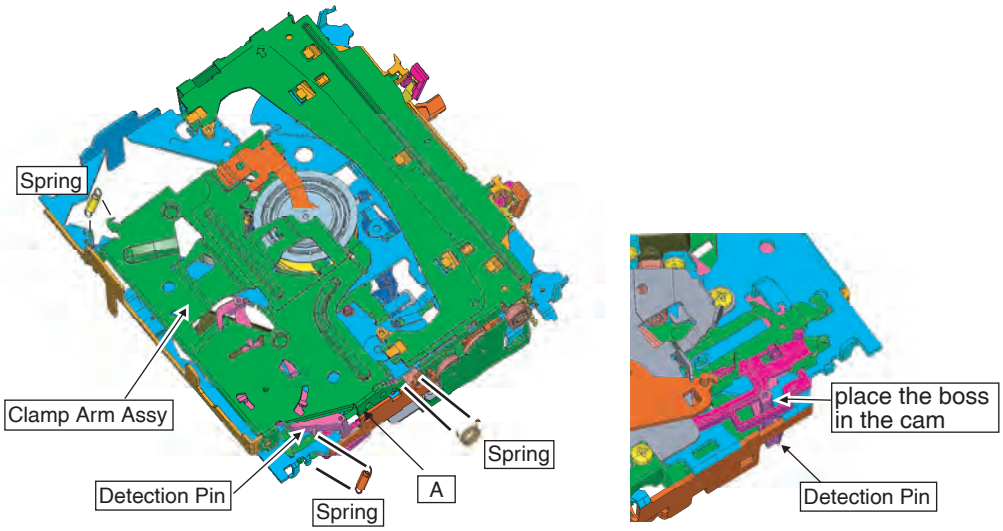




● How to remove the Clamp Arm Assy

1. Make the system in the carriage mechanism mode, and set the mechanism to the eject mode.
2. Remove the three Springs.
3. While pressing the position A, turn the Clamp Arm Assy upward, slide it to the left, and remove.

Caution: When assembling, place the boss of the Detection Pin in the cam unit of the Loading Rack.



● How to remove the Spindle Motor Assy

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Set the mechanism to the eject mode and remove the Clamp Arm Assy.
4. Set the mechanism to the clamped and move the Pickup to circumference.
5. Remove the two Screws, and remove the Spindle Motor Assy.